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PROVINCE OF ONTARIO
DEPARTMENT OF MINES

HON. CHARLES MCCREA, *Minister of Mines*

THOS. W. GIBSON, *Deputy Minister*

APPRAISAL
OF
PLANT AND PROPERTY
OF THE
Union Natural Gas Company of Canada, Limited

COMMITTEE

- R. B. HARKNESS.....Natural Gas Commissioner
R. O. WYNNE-ROBERTS.....Consulting Engineer
D. R. ROBERTS.....Accountant

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO
Printed and Published by Clarkson W. James, Printer to the King's Most Excellent Majesty
1923



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DEPARTMENT OF MINES

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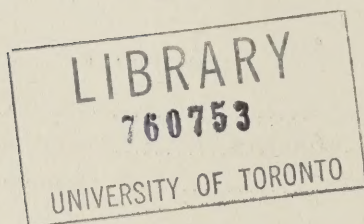
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INTRODUCTORY LETTER

TO THE HONOURABLE CHARLES MCCREA,
Minister of Mines,
Toronto, Ont.

SIR,—*Re* Appraisal of Plant and Property of the Union Natural Gas Company of Canada, Limited, Chatham.

In accordance with directions received from your department, dated March 12th, 1923, we have ascertained the historical cost, as far as possible, the reproduction cost new, and the depreciation of the plant and property of the Union Natural Gas Company of Canada, Limited. The report on the Historical Cost fortunately was completed by Mr. D. R. Roberts before his sudden and much regretted death on October 14th.

The basis of appraisal and the instructions for applying the same, as drawn up by the Natural Gas Board of Reference and received by us from the department, are as reproduced below. These we have endeavoured to observe and carry into effect.

We respectfully submit the following report incorporating the above information.

We have the honour to be, Sir,

Yours obediently,

R. B. HARKNESS,
Natural Gas Commissioner.

R. O. WYNNE-ROBERTS,
Consulting Engineer.

TORONTO, December, 1923.

APPRAISAL OF PLANT AND PROPERTY OF THE UNION NATURAL GAS COMPANY

The following is the basis of appraisal and instructions relating thereto, as drawn up by the Natural Gas Board of Reference.

I. Basis of Appraisal

1. Historical cost of plant and holdings.
2. Reproduction cost new of the same.
3. Depreciation, showing:
 - (a) The amount of expenditure necessary to restore the plant to normal operating efficiency.
 - (b) Annual and accrued amortization: (1) on the straight line basis; (2) on a sinking fund basis.
 - (c) Actual physical depreciation accrued up to date of appraisal, together with amount of annual accrual.
 - (d) Amount of depreciation to be deducted from historical cost.

II. Property to be Appraised

1. Leaseholds:
 - (a) At cost;
 - (b) Value on basis of gas in place.
2. Lands in fee:
 - (a) Cost;
 - (b) Fair market value.
3. Private rights of way and easements:
 - (a) At cost;
 - (b) Fair market value.
4. Value of public franchise:
 - (a) At cost;
 - (b) Present value.
5. Buildings and general structures, including necessary building equipment:
 - (a) At cost;
 - (b) Replacement value.
6. Payments, annual or otherwise, for taking and holding options in respect of lands and leaseholds not now owned by the company.
7. Replacement value of wells, including cost of drilling, subdivided to show:
 - (a) Dry holes;
 - (b) Wells now producing;
 - (c) Abandoned wells.
8. Well equipment, including fittings, drips and pumping equipment:
 - (a) At cost;
 - (b) Replacement value.
9. Compressor station:
 - (a) At cost;
 - (b) Replacement value.
10. Pipe lines, segregated as between field or gathering lines, transmission lines and distributing lines, including fittings, etc.:
 - (a) At cost;
 - (b) Replacement value.
11. Regulators:
 - (a) At cost;
 - (b) Replacement value.

12. Telephone lines:

- (a) At cost;
- (b) Replacement value.

13. Services:

- (a) At cost;
- (b) Replacement value.

14. Meters and installation:

- (a) At cost;
- (b) Replacement value.

15. Autos, horses, vehicles and other transportation equipment

- (a) At cost;
- (b) Replacement value.

16. Tools and miscellaneous equipment:

- (a) At cost;
- (b) Replacement value.

17. Office and general equipment:

- (a) At cost;
- (b) Replacement value.

It is recognized that the records of the company may not reflect the above classification of property, and it is left to the appraisers to make the segregation of cost in the best possible manner.

III. Appraisal of Intangibles

1. The appraisers need not consider (a) errors and omissions in inventory, (b) contingencies, (c) discounts on securities, brokerage, etc., (d) going value, it being agreed that the company may present its case upon those matters upon its own evidence.
2. The appraisers will consider and report upon element of cost and value of:
 - (a) Engineering during construction;
 - (b) Promotion, organization, administration, and legal expense, prior to construction;
 - (c) Administration and legal expenses during construction;
 - (d) Insurance during construction;
 - (e) Interest during construction;
 - (f) Taxes during construction.

IV. Working Capital

The appraisers will also make an estimate of the requirements for working capital.

V. Value of Service

The appraisers will also report upon the value of the service rendered the public, having regard to the value and convenience of natural gas as compared with other fuels.

The sequence in which the documents are presented herewith, conforms as nearly as practicable to the order of the instructions.

HISTORICAL COST

The Gas Company's books have been examined from 1914 to July 31st, 1923, and the following report on the historical cost is based upon the information compiled in the course of the examination.

By an indenture dated the first day of January, 1912, the Volcanic Oil & Gas Company, Limited, sold and assigned to the Union Natural Gas Company

of Canada, Limited, its business and its stock in trade, and the goodwill of its business, particulars of which business and stock in trade are set out in Exhibit I.

In consideration of the transfer and sale of its business, etc., the Volcanic Oil & Gas Company received from the Union Natural Gas Company:—

Capital stock having a par value of	\$1,649,600
First mortgage 6 per cent. gold bonds amounting to	550,000

A total consideration of	\$2,199,600
------------------------------------	-------------

By an indenture dated the first day of January, 1912, the United Fuel Supply Company, Limited, sold and assigned to the Union Natural Gas Company, Limited, its business and its stock in trade, particulars of which are set out in Exhibit II, and the goodwill of its business, receiving in consideration therefor:—

Capital stock having a par value of	\$1,025,000
First mortgage 6 per cent. gold bonds amounting to	450,000

A total consideration of	\$1,475,000
------------------------------------	-------------

By an indenture made the first day of January, 1912, the Ridgetown Fuel Supply Company, Limited, sold and assigned to the Union Natural Gas Company, its business and its stock in trade, etc., particulars of which are shown in Exhibit III, and the goodwill of its business, receiving therefor:—

Capital stock having a par value of	\$324,700
---	-----------

The business of these three contributing companies was continued without interruption by the Union Company.

In the indenture of sale and transfer no amount is set down as the value of the goodwill, but there can be little doubt that the consideration given embraced it.

On the first day of January, 1912, the company's financial position was as follows:—

Plant for the production and sale of gas and oil	\$3,915,300.01
Capital stock of the Medina Natural Gas Company	23,999.99
Capital stock of the Northern Pipe Line Company	60,000.00
Cash	700.00

Total	\$4,000,000.00
-----------------	----------------

Liabilities:

Capital stock	\$3,000,000.00
First mortgage 6 per cent. gold bonds	1,000,000.00

Total	\$4,000,000.00
-----------------	----------------

During the period January 1st, 1912, to July 31st, 1923, inclusive, additions were made to the plant, etc., amounting to \$2,343,780.42, bringing the total amount of the investment for the production and sale of gas and oil to \$6,343,780.42, as shown in Exhibit IV.

On February 13th, 1917, the company assigned to the Hope Exploration Company of Canada, Limited, 107 leases covering land in the townships of Dover East, Tilbury East, Tilbury West, and Raleigh, receiving in consideration therefor \$44,318 of capital stock of the Hope Exploration Company. This sale of assets was treated as a profit, and the proceeds, Hope capital stock, were distributed among the shareholders as a stock dividend.

The \$44,318 was not deducted by the company from the amount of its investments. We have deducted it, however, as shown in Exhibit IV.

On July 14th, 1917, the company bought back these leases at the same price at which they were sold, recharging the amount to investment account.

In 1919, the company reduced its invested capital by the sale and transfer of certain real estate in the Township of Dover to the amount of \$82,416.57, the greater part of which was assigned to the Empire Land Company, the company receiving in consideration therefor 855 shares of the capital stock of the Empire Land Company and a cash payment of \$3,632.88.

During 1920, the company sold and assigned to the Union Exploration Company, Limited, leases to the amount of \$500,000, crediting investment account with a like amount.

But here again a situation is created similar to that of the Hope Exploration Company, in that its operations are the operations of the Union Natural Gas Company divided so as to ascertain more nearly particular costs.

In 1921, the company paid the Union Exploration Company \$2.50 per foot for drilling certain wells; but in 1921 the company charged to profit and loss account \$39,092.54, and in 1922, \$43,005.53 on account of losses sustained by the Union Exploration Company. It appears then that the assets of the Union Exploration Company are essentially the assets of the Union Natural Gas Company and that the operations of the first named company are practically the operations of the Union Natural Gas Company. Consequently, we have added the amounts standing in the name of the before mentioned company to the amount of capital investment of the Union Natural Gas Company.

Part of the consideration given for a lease granted by one, Myers, was the draining of the property by the company. This was done at a net cost of \$23,638.05. The amount was taken into account as an operating expense.

Inasmuch as the cost of the drainage formed part of the purchase price of the lease, and does not in any way appear to be an ordinary operating expense, this amount has also been added to gas and oil investments. See Exhibit IV.

On January 31st, 1920, the company bought the Canadian Gas Company's property for \$500,000. Part of this property was sold to the Union Exploration Company, leaving the net amount of \$498,427.50 to be added to oil and gas investment. See Exhibit IV.

An inventory of part of the property was taken, as shown in Exhibit V.

On February 28th, 1919, the company bought the Tilbury Town Gas Company's plant for \$76,238.23. This amount, of which \$75,205.04 was for real estate, is included in additions to plant shown in Exhibit IV.

On January 31st, 1920, the company bought the property of the Canadian Gas Company, Limited, for \$500,000. An inventory of part of the property was taken, a copy of which will be available for the Board of Reference.

On January 1st, 1923, the company bought the business and the property, etc., of the Northern Pipe Line Company for \$248,388.90. See Exhibit VI.

And at the same date, the company bought the business and property, etc., of the Union Exploration Company for \$620,431.93. See Exhibit VII. (We had already considered this business as the business and property of the Union Natural Gas Company.)

Owing to few or no prices being set against the several properties, plant, etc., assigned to the company in 1921 and later, it has been found impossible to segregate the costs as asked for in the memorandum of the Basis and Scope of Appraisal.

Other Investments

The company's investments, other than for the production and sale of gas and oil, were, as at January 1st, 1912:—

Capital stock of the Medina Natural Gas Company.....	\$23,999.99
Capital stock of the Northern Pipe Line Company.....	60,000.00

On May 30th, 1912, the company sold its shares in the Medina Natural Gas Company for \$39,000.00, making a profit of \$15,000.01.

On January 31st, 1912, the company sold some of its shares in the Northern Pipe Line Company, to the amount of \$400.

On December 31st, 1913, the company received from the Northern Pipe Line Company a stock dividend of \$59,600, making its holdings of this stock at that date \$119,200.

In November and December, 1922, the company increased its holding of Northern Pipe Line Company stock by \$120,700, making its total investment in that stock, as at December 31st, 1922, \$239,900.

On January 1st, 1923, these shares were converted into cash which was used as part payment in the purchase of the business and the property of the Northern Pipe Line Company. See Exhibit VI.

At the same date, the company also retired its shares in the Union Exploration Company and bought back the leases, etc., that it had sold to this company in 1920 and at subsequent dates. See Exhibit VII.

As we have already shown, this business and property was, for all intents and purposes, the business and the property of the Union Natural Gas Company.

At one time and another, the company bought Dominion of Canada bonds to the amount of \$318,190.

On July 31st, 1923, the investments of the company for other than the production and sale of gas and oil, were as follows:—

Empire Land Company stock.....	\$ 90,225
Dominion of Canada bonds.....	318,190
Dover mortgages purchased.....	1,100

Total.....	\$409,515
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Capital Stock

On May 30th, 1914, the company increased its capital stock from \$3,000,000 to \$6,000,000.

In June of the same year, there was distributed to the shareholders a stock dividend of \$1,660,000, as a profit on the increased value of the leases held by the company.

Subsequently, the company sold shares of the new stock to the amount of \$564,000, leaving in hand \$776,000 of treasury stock.

On July 31st, 1923, the capital stock account stood as follows:—

Authorized capital.....	\$6,000,000	
*Paid up.....	\$5,224,000	
In treasury.....	776,000	
	<hr/>	<hr/>
	\$6,000,000	\$6,000,000

* Includes \$1,660,000 distributed as a stock dividend.

Exhibit I

1. The entire business of the Volcanic Oil & Gas Company, Limited, wherever the same is being carried on and the good will thereof.

2. The stock in trade of the company, including all pipes, fittings and supplies, meters and regulators.

3. All horses, carts, wagons, sleighs, and harness owned by the party of the first part in connection with the said business, and one Ford automobile.

4. All business fixtures, office furniture, and everything used in or about the business.

5. All oil wells or gas wells owned by the party of the first part and all the equipment, plant, and machinery owned and used in connection therewith.

6. About twenty-two miles of 10-inch line pipe, with Dresser couplings, and about twenty-one and a half miles of 8-inch line pipe, used in the said business for conveying natural gas from the Tilbury field in the County of Kent to the limits of the City of Windsor in the County of Essex.

7. About eighteen and a half miles of pipe line composed of one mile of 8-inch, nine and a half miles of 6-inch and eight miles of 6¼-inch, being the pipe line used in the said business for conveying natural gas from the Tilbury field to the limits of the City of Chatham in the County of Kent.

8. About twelve miles of pipe line composed of four miles of 4-inch and eight miles of 3-inch, being the pipe line used in the said business for conveying natural gas from the end of its line at Chatham to the Town of Blenheim in the County of Kent.

9. About three and one-half miles of 3-inch pipe line used in the said business for conveying natural gas from its main line to the Village of Comber in the County of Essex.

10. About two miles of 2-inch pipe line used in the said business for conveying natural gas from its main line to the Village of South Woodsee in the County of Essex.

11. About three and one-quarter miles of 3-inch pipe line used in the said business for conveying natural gas from its main line to the Town of Essex in the County of Essex.

12. About five and one-half miles of 3-inch pipe line used in the said business for conveying natural gas from its main line to the Village of Belle River in the County of Essex.

13. About eight miles of 2-inch pipe line used in the said business for conveying natural gas from its main line to the Village of Tecumseh in the County of Essex.

14. About two miles of 3-inch pipe line and six miles of 2-inch pipe line used in the said business as a low pressure plant for the distribution of natural gas in the Village of Comber in the County of Essex.

15. About one mile of 2-inch pipe line used in the said business for a low pressure plant at the Village of Ruscomb in the County of Essex.

16. About one and one-half miles of 3-inch and four miles of 2-inch pipe line used in the said business as a low pressure plant in the Village of North and South Woodsee in the County of Essex.

17. About one-half mile of 4-inch, two miles of 3-inch and seven miles of 2-inch pipe line used as a low pressure plant for the distribution of natural gas in the Town of Essex in the County of Essex.

18. About two miles of 3-inch and five miles of 2-inch pipe line used in the said business as a low pressure plant for the distribution of natural gas in the Village of Belle River in the County of Essex.

19. About three and one-half miles of 2-inch pipe line used in the said business as a low pressure plant for the distribution of natural gas in the Village of Tecumseh, in the County of Essex.

20. About one-half mile of 4-inch, two miles of 3-inch and eight miles of 2-inch pipe line used in the said business as a low pressure plant for the distribution of natural gas in the Town of Blenheim in the County of Kent.

21. About one and three-quarters miles of 8-inch, three miles of 6-inch, ten miles of 3-inch and three miles of 2-inch pipe used in the said business as pipe lines connecting gas wells to the main lines.

22. About two miles of 2-inch, 1½-inch, 1¼-inch, and 1-inch pipe used in the said business as a low pressure plant for the distribution of natural gas in the Village of Fletcher in the County of Kent.

23. About one mile of 2-inch pipe line and one-half mile of 1-inch pipe used in the said business as a low pressure plant in the unincorporated Village of Northwood in the Township of Harwich.

24. About one and one-half miles of 3-inch and one mile of 2-inch pipe line located on the Halliday Oil Lease and used as oil lines, fuel lines, steam lines, etc.

25. All drive pipe, casing, tubing, etc., which is contained in the gas and oil wells, the property of the party of the first part.

26. Telephone line laid from the gas field to the limits of the City of Windsor, being forty-three miles in length and having cost between \$4,000 and \$5,000.

27. Some 112,899 feet, 4 inches of 12-inch line pipe now lying at different stations along the line of the Pere Marquette Railway between the Tilbury field and the City of London.

28. Certificates numbers 19, 55, 56, 68, 69, 93, 94, 101, 102, for 1,198 shares of the capital stock of the Medina Natural Gas Company, Limited.

29. Also all and singular of the other goods, chattels, and effects of the Volcanic Oil & Gas Company, Limited, of whatsoever nature or kind and wheresoever situate, excepting only the book debts of the company incurred prior to the first day of January, 1912, and excepting also all money in the bank or securities for money owned by the said company.

On January 1st, 1912, an assignment of an agreement for the supply of gas to the Chatham Gas Company, dated June 26th, 1907, and an agreement dated May 29th, 1909, for the supply of gas to the Windsor Gas Company, and on the same date eight leases covering certain properties in the Townships of Rochester, Sandwich, Maidstone, and in the Village of Comber and the Town of Essex.

Also a lease covering part of lot 23 in concession III, Township of Raleigh, transferred to the Volcanic Company by the Iroquois Pipe Line Company.

Also fifteen rights of way through the Town of Blenheim, Village of Comber, Village of Belle River, Town of Essex, and through certain parts of the Townships of Harwich, Raleigh, Tilbury East, Tilbury West, Tilbury North, Rochester, Romney, Maidstone, Sandwich South, Sandwich West, and Sandwich East.

Also nineteen rights of way through certain other parts of the Townships of Raleigh, Tilbury East, Harwich, and Romney, and through part of lot 24 in the City of Chatham.

Also eight assignments of right to drill and remove in certain parts of the Township of Tilbury East.

Also twelve orders from the Board of Railway Commissioners for Canada, giving the right to lay and maintain pipe line under the track of the Michigan Central Railway and the Canadian Pacific Railway.

Also seventy-eight leases covering about 6,033 acres of land in the Counties of Kent and Essex upon which thirty-seven oil and gas wells are drilled.

Also the lands and premises owned and occupied by the company as a regulating station, with the regulators and valves attached thereto.

Also land and premises owned and occupied by the company as office premises and warehouse in the City of Chatham.

Also about 1,400 meters of different sizes, No. 4 Tobey to five light meters, and over 100 regulators from 8-inch to 1-inch used at the different plants of the company and along the main lines for the proper distribution of gas; also three boilers, four gas engines, two steam engines, three drilling derricks, four pumping derricks, seven 250-barrel tanks, five 60-barrel tanks, valves and stop cocks of all kinds, regulator houses, curb boxes, one automobile, one horse, one buggy and harness; also office furniture, desks, tables and chairs in the premises of the company at Chatham and in the office rented by the company at Niagara Falls.

Exhibit II

1. The entire business of the United Fuel Company, Limited, wherever the same is being carried on, and the goodwill thereof.

2. The stock in trade of the said company, including all pipes, fittings and supplies, meters and regulators.

3. All horses, carts, wagons, sleighs and harness, owned by the party of the first part in connection with the said business, and one automobile.

4. All business fixtures, office furniture, and everything used in or about the business.

5. All oil wells or gas wells owned by the party of the first part and all the equipment, plant, and machinery owned and used in connection therewith.

6. About fifty-one miles of 8-inch line pipe, screw joint, and six miles of 10-inch screw joint pipe from the gas wells of the company in the County of Kent, to the limits of the Town of Sarnia.

7. About three miles of 2-inch line pipe, screw joint, from the main line and three-quarters of a mile west in the Township of Dover East, concession IV; and two and a quarter miles of

2-inch, east of the main line on the Creek road between concessions III and IV, in the Township of Dover East, all high pressure.

8. About nine and a quarter miles of $4\frac{1}{4}$ -inch line pipe, Dayton couplings, conveying gas from the main line, South River road, south of Wallaceburg to the limits of the Town of Dresden.

9. About one and a half miles of 6-inch line pipe, screw joint, from the main line, concession I, gore of Chatham, west to and connecting with the Northern pipe line.

10. About three miles and three-quarters of 2-inch line pipe, screw joint, from the main line east in the Township of Moore, concession V, to the limits of the Village of Brigden.

11. About nine miles and a half of $6\frac{1}{4}$ -inch line pipe, screw joint, from the main line in the Township of Moore, to the limits of the Town of Petrolia.

12. About four miles of 2-inch line pipe, screw joint, from the main line south of the Indian Reserve along the River road to the Village of Corunna.

13. About two miles of 2-inch line pipe, screw joint, from concession X of the Township of Enniskillen to the Village of Marthaville.

14. Paincourt—about one mile of 2-inch low pressure line.

15. Brigden—about three-quarters of a mile of 2-inch high pressure line and about one mile and a quarter of 2-inch low pressure line, and about three-quarters of a mile of 3-inch low pressure line.

16. Corunna—about one mile of 2-inch low pressure line.

17. Marthaville—about one mile and a quarter of 2-inch low pressure line.

18. Dresden—about four miles and a half of 2-inch low pressure line; about three-quarters of a mile of 2-inch high pressure line; about three-quarters of a mile of 4-inch high pressure line; two miles of 3-inch high pressure line; and one-half mile of 3-inch low pressure line.

19. All drive pipe, casing, tubing, etc., which is contained in the gas wells, the property of the party of the first part.

20. Certificate No. 45, covering 596 shares of the capital stock of the Northern Pipe Line Company, Limited; also all and singular of the other goods, chattels, and effects of the United Fuel Supply Company, Limited, of whatsoever nature and kind and wheresoever situate, except only the book debts of the company incurred prior to the first day of January, 1912, and excepting also all money in the bank or securities for money owned by the said company.

Also forty-seven oil and gas leases covering about 4,465 acres in the Townships of Romney, Tilbury East, and Raleigh, upon which nine gas wells are drilled.

Also seven oil and gas leases covering about 390 acres in the Townships of Tilbury East, upon which land there is one gas well.

Also 132 rights of way in the Townships of Raleigh, Dover East, Chatham, and Moore.

Also ten franchises for right of laying gas or oil pipe lines along the highways in the Townships of Raleigh, Tilbury East, Dover East, Chatham and North Gore, Moore, Sombra, Romney, Enniskillen, and Camden.

Also franchise for right to lay pipe lines along streets of the Town of Dresden.

Also seven contracts entitling the holders to certain rights, benefits, and advantages.

Exhibit III

1. The entire business of the Ridgetown Fuel Supply Company, Limited, wherever the same is being carried on, and the goodwill thereof.

2. The stock in trade of the said company including all pipes, fittings and supplies, meters and regulators.

3. All horses, carts, wagons, sleighs, and harness owned by the party of the first part in connection with the said business.

4. All business fixtures, office furniture, and everything used in or about the business.

5. All gas wells owned by the party of the first part and all the equipment, plant, and machinery owned and used in connection therewith.

6. About twenty-three miles of $4\frac{1}{4}$ -inch pipe line, five and a half miles of 3-inch line pipe, seven miles of 2-inch line pipe, being the pipe line used by the Ridgetown Fuel Supply Company, Limited, for conveying natural gas from its wells in the County of Kent to the limits of the Town of Ridgetown, Ontario.

7. The 5-inch, 3-inch, and 2-inch lines forming the distributing plant in the Town of Ridgetown, together with the high and low pressure regulators situate therein.

8. The pipe lines from Ridgetown to Highgate, and the distributing plant in Highgate composed of 5-inch, 3-inch, $2\frac{1}{2}$ -inch, and 2-inch line pipe.

9. All drive pipe, casing, tubing, etc., which is contained in the gas wells, the property of the party of the first part, and all plant and equipment used in connection therewith, excepting iron in the Cole well south of Ridgetown.

10. Some 112,899 feet, 4 inches of 12-inch line pipe now lying at different stations along the line of the Pere Marquette Railway between the Tilbury field and the City of London.

Also certain rights and privileges in the southwest half of the northwest 100 acres of lot 8, concession XV, of the Township of Tilbury East, containing fifty acres. Also certain mineral rights and privileges in lot 9, concession XII, in the Township of Tilbury East, and the south half of lot 10, concession XII, in the same township, 300 acres.

Also the rights to drill for oil and gas on the south half of the south half of lot 9, on the south side of the middle road in the Township of Tilbury East, fifty acres; and the easterly

fifteen acres of Gore, lot 8, concession XI, in the Township of Tilbury East; together with all oil and gas wells upon the said premises and all oil and gas pipes and fittings, casing, tubing and other fixtures, plant and equipment, upon said premises, used in the operation of said premises, and rights for oil and gas purposes and all franchises in connection with said premises.

Also fourteen rights of way through and upon land in the Townships of Raleigh, Howard, and Harwich.

Also 180 oil and gas leases covering 13,383 acres of land in the Townships of Tilbury East, Raleigh, and Romney, upon which land nine gas wells are drilled.

Exhibit IV

ADDITIONS TO THE ORIGINAL INVESTMENT OF \$3,915,300.01

Leaseholds.....		\$112,039.45
Rights of way.....		3,116.97
Buildings.....		28,802.58
Fittings.....	\$55,946.68	
Less sold.....	546.25	
		<u>55,400.43</u>
Other material.....		107,390.04
Labour.....		74,334.28
Gas receivers and regulators.....		23,350.82
Office furniture.....		8,072.40
Tools.....		8,476.23
Drilling material.....		19,527.66
Natural gas meters.....		29,411.38
Line pipe.....	\$568,836.94	
Less sold to N. P. L. Co.....	7,785.50	
		<u>561,051.44</u>
Telephone and telegraph.....		1,873.59
Drilling wells.....		222,988.32
Real estate.....		92,378.40
Boilers and engines.....		11,631.31
Compressor station.....		184,534.22
Drilling tools.....		36,550.73
		<u>\$1,580,930.25</u>
Add as at January 1st, 1912.....		3,915,300.01
		<u>\$5,496,230.26</u>
Less leaseholds assigned to Hope Exploration Company.....		44,318.00
		<u>\$5,451,912.26</u>
Less leases assigned to Union Exploration Company.....		500,000.00
		<u>\$4,951,912.26</u>
Add:—		
Northern Pipe Line Company property.....	\$248,388.90	
Union Exploration Company property.....	620,431.93	
Canadian Gas Company property.....	498,427.50	
Cost of Myers' drainage.....	23,638.05	
Cost, incomplete, producing wells.....	981.78	
		<u>\$1,391,868.16</u>
Total.....		<u>\$6,343,780.42</u>

Exhibit V

INVENTORY OF PART OF THE PROPERTY BOUGHT OF THE CANADIAN GAS COMPANY, LIMITED

Fittings in lines:

Valves.....	\$1,385.72
Tees.....	351.00
Ells.....	131.39
Nipples.....	1,154.26
Unions.....	226.60

Plugs.....	21.26
Couplings.....	66.50
Collar leak clamps and saddles.....	53.25
Reducers.....	5.22
Bushings.....	13.36
Cocks.....	79.92
Regulators.....	136.00
Fittings and stock valves.....	116.20
Tees.....	33.60
Ells.....	39.75
Nipples.....	88.23
Unions.....	42.00
Plugs.....	20.79
Couplings.....	70.05
Collar clamps and saddles.....	226.15
Regulators.....	195.00
Flow gauges.....	4.00
Cocks.....	11.75
Pipe and casing in wells.....	52,795.25
do do stock.....	8,357.74
do do lines.....	21,052.20
Brass cocks in wells.....	25.85
Nipples in wells.....	33.05
Swedge nipples in wells.....	42.24
O'dell barrels in wells.....	641.25
Clamps and bolts in wells.....	275.20
Valves in wells.....	1,053.50
Tees in wells.....	107.10
Steel shoes in wells.....	20.00
Packers in wells.....	1,717.00
do.....	284.00
Foundations at wells.....	234.00
Galvanized iron houses at wells.....	450.00
Pumping outfits at wells.....	7,050.00
Material on hand:	
Pumping outfits.....	1,490.00
Tanks.....	180.00
Engines.....	335.00
Gauges.....	142.50
Tongs.....	170.00
Cutters.....	79.75
O'dell barrels.....	128.25
Valve stems.....	20.25
Packers.....	251.18
Connection at Port Alma measuring station.....	503.98
Buildings.....	1,700.00
Miscellaneous:	
McLaughlin runabout.....	500.00
Horse, buggy and other material.....	698.19
	<u>\$103,809.49</u>
Less sold:	
Runabout.....	\$500.00
Pumping outfits.....	1,072.50
	<u>1,572.50</u>
	<u>\$102,236.99</u>

This leaves the balance of \$396,190.51 to cover leases, franchises, and agreements.

Exhibit VI

MEMORANDUM OF AGREEMENT, made in triplicate, this 31st day of December, 1922.

BETWEEN:

THE NORTHERN PIPE LINE COMPANY, LIMITED, a Joint Stock Company organized and carrying on business under the laws of Ontario,

of the First Part,

AND

THE UNION NATURAL GAS COMPANY OF CANADA, LIMITED, a Joint Stock Company organized and carrying on business under the laws of Ontario,

of the Second Part.

WHEREAS, the said party of the first part owns and operates a pipe line for the transmission of natural gas from what is known as the Tilbury Gas Field, in the County of Kent, to the Town of Wallaceburg, and is engaged in the business of buying, transmitting and selling natural gas along the said pipe line and to the Corporation of the Town of Wallaceburg and to the Dominion Sugar Company, Limited, and the Dominion Glass Company, Limited, at Wallaceburg, and to various other persons and corporations.

AND WHEREAS, the party of the first part has contracted and agreed with the party of the second part for the absolute sale to the party of the second part of its said pipe line and of its business and of all its assets and also to assign to the said party of the second part all its contracts respecting the transmission and sale of natural gas and likewise its contracts respecting the purchase of gas, for the consideration and upon the terms and conditions hereinafter set forth.

NOW THIS INDENTURE WITNESSETH that in pursuance of the said agreement, and in consideration of the sum of Two Hundred and Forty-Eight Thousand, Three Hundred and Eighty-Eight and 90/100 dollars (\$248,388.90) of lawful money of Canada, of which Two Hundred and Thirty-Nine Thousand, Nine Hundred dollars (\$239,900.00) is cash and the balance, Eight Thousand, Four Hundred and Eighty-Eight and 90/100 dollars (\$8,488.90) is paid by the party of the second part assuming the debts and liabilities of the party of the first part which now amount to that sum, paid by the said party of the second part to the said party of the first part at or before the sealing and delivery of these presents; the said party of the first part hath granted, bargained, sold, assigned, transferred, and set over, and by these presents doth grant, bargain, sell, assign, transfer and set over unto the said party of the second part, its successors and assigns, all that the above described property, that is to say:

(1) The pipe line together with all its fittings, valves and equipment heretofore owned and operated by the party of the first part and running from a point at or near Port Alma in the Township of Tilbury East, in the County of Kent, to the Town of Wallaceburg, in the County of Kent.

(2) All rights, benefits and advantages to which the party of the first part is entitled by virtue of a contract dated 27th May, 1908, between The Leamington Oil Company, Limited, and Dr. Garnet Holmes, et al, and the assignment thereof to the party of the first part by agreement between Dr. Garnet Holmes, et al, and the party of the first part, dated 1st September, 1909.

(3) All rights, benefits and advantages to which the party of the first part is entitled under a certain agreement between the party of the first part and The Dominion Sugar Company, Limited, and The Sydenham Glass Company, Limited, dated 29th September, 1909, and as amended by an agreement between the same parties dated the 8th of October, 1909.

(4) All rights, benefits and advantages to which the said party of the first part is entitled under an agreement between the party of the first part or its promoters and The Consumers Gas Company, Limited (Wallaceburg) or The Wallaceburg Gas Company, Limited.

(5) All rights, benefits and advantages to which the party of the first part is entitled under the Municipal Franchises held by it from the Townships of Tilbury East, Raleigh, Dover and Chatham.

(6) All private rights of way owned by the said party of the first part and all its lands and premises wheresoever situated.

(7) The house, office building and all other buildings situate on land of the Company in the Town of Wallaceburg and together with the land on which same are situate.

(8) All regulator and meter fittings and all loose material now on hand as per schedule hereto attached marked "A" and also one Ford car.

(9) All the business of the party of the first part as a going concern and all rights, benefits and advantages to which the party of the first part is or may become entitled in respect of contracts which it has entered into with consumers for the transmission and sale and delivery of natural gas to such consumers, together with all cash on hand, cash in the bank, book debts and securities for money of whatsoever nature and kind, the intention hereof being to transfer to the party of the second part the entire business of the party of the first part and all the property of whatsoever nature and kind owned by it, and likewise all its contracts of whatsoever nature and kind, and all the right, title, interest, property claim and demand whatsoever, both at Law and in equity, or otherwise, howsoever of the said party of the first part, in, to and out of the same and every part thereof.

TO HAVE AND TO HOLD the said hereinbefore assigned property and rights and every of them and every part thereof with the appurtenances and all the right, title and interest of the said party of the first part thereto and therein, as aforesaid, unto and to the use of the party of the second part and its successors and assigns forever.

AND the said party of the first part hereby covenants with the said party of the second part that it hath in itself good right to assign the same unto the said party of the second part in manner aforesaid, and according to the true intent and meaning of these presents.

AND that the said party of the second part shall and may from time to time and at all times hereafter peaceably and quietly have, hold, possess and enjoy the said hereby assigned property to and for its own use and benefit without any manner of hindrance, interruption, molestation, claim or demand whatsoever of, from or by the said party of the first part, or any person or persons whomsoever claiming under it, and the same free and clear, and freely and absolutely released and discharged or otherwise, at the costs of the said party of the first part, effectually indemnified from and against all former and other bargains, sales, gifts, grants, titles, charges, assignments and encumbrances whatsoever.

AND MOREOVER, that it, the said party of the first part, and all persons rightfully claiming or to claim any estate, right, title or interest of, in or to the said hereby assigned property and every part thereof, shall and will from time to time and at all times hereafter upon every reasonable request of the said party of the second part, but at the cost and charges of the said party of the second part, make, do and execute or cause to procure to be made, done and executed, all such further acts, deeds and assurances of the same for the more effectually assigning and assuring the said hereby assigned property unto the said party of the second part, in the manner aforesaid, and according to the true intent and meaning of these presents as by the said party of the second part or its counsel in the Law shall be reasonably advised or required.

AND IT IS EXPRESSLY AGREED between the parties hereto that these presents shall be read and held as made by and with and granted to and imposed upon the respective parties hereto, and their respective successors and assigns, the same as though words "successors and assigns" had been inscribed in all proper and necessary places.

AND in consideration of the foregoing the party of the second part hereby covenants and agrees with the party of the first part that it will assume and it does hereby assume all liabilities, obligations and undertakings incurred, imposed or undertaken on the part of the said party of the first part in any and all of the said contracts, agreements and franchises including right-of-way agreements and the party of the second part hereby agrees to satisfy all such liability and to completely perform all such obligations and undertakings from time to time as they accrue due or as the performance of the same becomes due, and that it will fully and completely indemnify and save harmless the said party of the first part from all such liability, obligations and undertakings.

IN WITNESS WHEREOF the said parties have caused to be affixed hereto their official seals and the hands of their proper officers in that behalf.

Signed, Sealed and Delivered
In the presence of:

{	THE NORTHERN PIPE LINE CO., LIMITED,		
	(Sgd.)	F. E. OGDEN,	President.
	(Sgd.)	S. A. MORSE,	Secretary.
	THE UNION NATURAL GAS CO. OF CANADA.		
{	LIMITED.		
	(Sgd.)	F. E. OGDEN,	President.
	(Sgd.)	S. A. MORSE,	Secretary.

Certified a true copy.

S. A. MORSE,
Secretary.

NOTE.—A copy of the inventory of drilling equipment transferred from the Northern Pipe Line Company, Limited, to the Union Natural Gas Company of Canada, Limited, will be available for the Board of Reference.

Exhibit VII

MEMORANDUM OF AGREEMENT, made in triplicate, this 31st day of December, 1922.

BETWEEN:

THE UNION EXPLORATION COMPANY, LIMITED,

of the First Part,

AND

THE UNION NATURAL GAS COMPANY OF CANADA, LIMITED

of the Second Part.

WHEREAS, the party of the first part is the owner of certain leaseholds in the Township of Dawn, in the County of Lambton, and the Township of Tilbury East, and Dover, in the County

of Kent, and the Township of Colchester South in the County of Essex, and also owns the wells drilled on the said leases together with all equipment, casing, tubing, pipe line, regulators, tools, etc.

AND WHEREAS the party of the first part has contracted and agreed with the party of the second part for the absolute sale to the party of the second part of the said leaseholds, wells, equipment, pipe line, regulators, tools, etc., for the consideration and upon the terms and conditions hereinafter set forth.

NOW THIS INDENTURE WITNESSETH that in pursuance of the said agreement and in the consideration of the sum of Six Hundred and Fifty Thousand dollars of lawful money of Canada now paid by the party of the second part to the party of the first part, the receipt whereof is hereby by it acknowledged, the said party of the first part hath hereby granted, bargained, sold, assigned, transferred, and set over, and by these presents doth grant, bargain, sell, assign, transfer and set over unto the said party of the second part, its successors and assigns, all hereinafter described property, that is to say:—

1. All leases, and leaseholds in the said Township of Dawn, Tilbury East, Dover and Colchester South now held by the party of the first part as will be more particularly set forth and described in an assignment of same to be registered.

2. All wells and equipment including all casing, tubing in said wells drilled on any of the said leaseholds and including all pipe lines, regulators, and equipment.

3. All tools, and drilling equipment as more particularly described in Schedule "A" hereto attached.

TO HAVE AND TO HOLD the said hereinbefore assigned property and rights and every of them and every part thereof with the appurtenances and all the right, title and interest of the said party of the first part thereto and therein, as aforesaid, unto and to the use of the party of the second part and its successors and assigns forever.

AND the said party of the first part hereby covenants with the said party of the second part that it hath in itself good right to assign the same unto the said party of the second part in manner aforesaid, and according to the true intent and meaning of these presents.

AND that the said party of the second part shall and may from time to time and at all times hereafter peaceably and quietly have, hold, possess and enjoy the said hereby assigned property to and for its own use and benefit without any manner of hindrance, interruption, molestation, claim or demand whatsoever of, from or by the said party of the first part, or any person or persons whomsoever claiming under it, and the same free and clear, and freely and absolutely released and discharged or otherwise, at the costs of the said party of the first part, effectually indemnified from and against all former and other bargains, sales, gifts, grants, titles, charges, assignments and encumbrances whatsoever.

AND MOREOVER, that it, the said party of the first part, and all persons rightfully claiming or to claim any estate, right, title or interest of, in or to the said hereby assigned property and every part thereof, shall and will from time to time and at all times hereafter upon every reasonable request of the said party of the second part, but at the cost and charges of the said party of the second part, make, do and execute or cause or procure to be made, done and executed, all such further acts, deeds and assurances of the same for the more effectually assigning and assuring the said hereby assigned property unto the said party of the second part, in the manner aforesaid, and according to the true intent and meaning of these presents as by the said party of the second part or its counsel in the Law shall be reasonably advised or required.

AND IT IS EXPRESSLY AGREED between the parties hereto that these presents shall be read and held as made by and with and granted to and imposed upon the respective parties hereto, and their respective successors and assigns, the same as though the words "successors and assigns" had been inscribed in all proper and necessary places.

IN WITNESS WHEREOF the said parties have caused to be affixed hereto their official seals and the hands of their proper officers in that behalf.

SIGNED, SEALED AND DELIVERED
In the presence of:

{	THE UNION EXPLORATION CO., LIMITED.	
	(Sgd.)	J. G. KERR, President,
	(Sgd.)	S. A. MORSE, Secretary.
	THE UNION NATURAL GAS CO. OF CANADA,	
	LIMITED.	
	(Sgd.)	F. E. OGDEN, President,
(Sgd.)	S. A. MORSE, Secretary.	

Certified a true copy.

S. A. MORSE,
Secretary.

NOTE:—A copy of the inventory of drilling equipment transferred from the Union Exploration Company to the Union Natural Gas Company will be available for the Board of Reference.

REPRODUCTION COST NEW OF PLANT AND PROPERTY

We submit herewith the inventories of every part of the Union Natural Gas Company's plant and property, together with reproduction costs as on July 31st, 1923.

We have deemed it advisable to present the inventories in detail as far as possible, so that it may be clear what is included and how the costs and the totals of every section are arrived at. We believe that this procedure will enable those interested to more fully satisfy themselves that we have endeavoured to deal justly with all matters referred to us.

The term "reproduction cost new" is not defined in the instructions. We have interpreted it to mean the reproduction of all parts with new material, although, as will be observed, a portion of the undertaking was constructed with second-hand material.

The reproduction costs are based upon prices of new material which prevailed about July 31st, 1923, and not on average prices for recent years.

DEPRECIATION

According to our instructions, it is necessary to estimate the depreciation on four distinct bases. We have endeavoured to follow these instructions.

(a) "*The amount of expenditure necessary to restore the plant to normal operating efficiency.*" We consider this to be a somewhat flexible condition, for the phrase, "normal operating efficiency," may mean the service which prevailed when the pressure in the fields was higher and the supply of gas was greater. It may, however, mean that condition which may be considered normal under the present situation with reduced pressure and supply of gas. Although the pressure is gradually becoming less and the volume of available gas is steadily declining, the domestic demand continues to increase. The normal operating efficiency changes in each year.

If, then, the standard for "normal operating efficiency" is to be considered as that, say, of 1918, some of the gas pipe lines would now have to be enlarged so as to attain the same efficiency. We have, however, ventured to interpret the term as meaning the general condition of the plant so far as its present capacity for service is concerned; for an old second-hand pipe in reasonably good condition can deliver a definite amount of gas as well as a brand new pipe, or, in other words, it will act as efficiently as a new system.

(b) "*Annual and accrued amortization: (1) on the straight line basis, (2) on a sinking fund basis.*" We desire to explain these bases. In the first place, we prefer to use the term "retirement reserve" as being more significant and more easily understood. In an ordinary business, such as waterworks, the life of the undertaking is perpetual, and the investors prudently require that their property should always be maintained at 100 per cent. value. This is done by annually retiring a certain percentage of the cost of the plant and investing it in new parts, or by building up a reserve which will be available for the purpose.

But a natural gas undertaking is like a mining concern which has an indefinite life, the duration of which can only be estimated. The investors require that

their capital shall be recouped within such estimated lifetime. This, however, is not depreciation.

The straight line basis implies that depreciation, amortization, or retirement reserve is provided for by setting aside equal annual instalments from the inception of the undertaking, until such a time as the life of the gas fields is estimated to be practically exhausted. No interest is included. This basis is simple, direct, easily calculated and applied. It has been adopted by several of the public service commissions.

The sinking fund basis entails setting aside annually a sum of money, which, with compound interest, will accumulate during the probable life of the gas fields to a sufficient amount to recoup the investors. We calculate the sinking fund on the basis of five per cent. compound interest.

The straight line or sinking fund basis for providing a retirement fund will probably constitute the only practicable method of amortizing the reproduction cost up to the present time; but with regard to the future, we do not consider that either of the above arrangements will prove satisfactory. Farther on, when we discuss leaseholds and gas in place, it will be observed that unless new sources of supply of gas are discovered, the present fields will not continue to furnish natural gas in sufficient volume to satisfy the consumers' requirements. The prospects are, therefore, a diminished production, a consequent restriction in the use of gas, and a reduction in the number of consumers. These conditions will, of course, steadily curtail the revenue and render it practically impossible to carry the same annual charge for amortization without involving the consumers in the latter years in exorbitant rates. We believe that the retirement reserve should in future be built up at a progressively diminishing rate and should be more or less in proportion to the rate of annual production. The retirement reserve would then be built up *pro rata* by those who consume natural gas.

The retirement reserve could be accumulated by a modification of the straight line method. The annual amounts to be credited to the reserve would be equal, but they would consist of interest on the amount in the fund together with payments from revenue to bring the sum up to the equal annual instalment. For example, if \$1,000 has to be refunded in ten years, the first year's payment from revenue would be \$100; the fifth year's payment would be \$80, plus 5 per cent. interest on \$400 accumulated by the fourth year; and the last payment would be \$55 from revenue, plus \$45 interest.

The fractional method is one way of approximately meeting this condition. Let it be assumed that the Tilbury fields would be able to supply gas at a diminishing rate until, say, 1935, that is for another twelve years. The sum of all the numbers from 1 to 12 is 78. There are twelve years from 1923 to 1935, and the portion of the retirement fund to be borne by the year 1923 would be $\frac{12}{78}$, or 15.4 per cent.; the period 1934 to 1935 is one year, and its share would be $\frac{1}{78}$, or 1.28 per cent. The load for each intervening year would be in proportion. For instance, in 1927, the remaining life would be 8 years, and the load for that year would be $\frac{8}{78}$, or 10.26 per cent.

Another method is to include in the rate a definite amount per 1,000 cubic feet to provide a retirement fund. This method has been adopted by the Board of Public Utility Commissioners of Alberta in connection with the Northern

Alberta Natural Gas Development Company. This board allowed for salvage at the rate of 10 per cent. in collecting and transmission lines, and 40 per cent. in city plant; it stated that "the sinking fund plan should not be adopted, as it is contrary in effect to the principle of retirement of the capital during the life of the supply of the gas. The board, therefore, allowed a rate of five cents per 1,000 cubic feet as the depreciation charge."

The company may use the retirement reserve fund for extensions, and also for replacements if the original cost of the work has been retired. It should, however, be clearly established that the retirement reserve account should be carefully recorded in the company's books and that any money withdrawn from the reserve fund for extensions or replacements, should bear interest at the same rate as the return to be allowed by the Board of Reference on the adopted rate base.

(c) "*Actual physical depreciation accrued up to date of appraisal, together with amount of annual accrual.*" To comply with this instruction we have inspected all parts of the company's plant. Exposures were made at points indicated by us and notes of the conditions found were made at each of such exposures. The exposures are numbered, and the efficiencies stated in the inventories. In addition to exposures, we examined all parts which were above the surface of the ground and made notes of their condition. The accrued physical depreciation will be stated in each section, but we cannot state the annual rate as the circumstances are so varied. The only satisfactory way of ascertaining the annual rate of physical depreciation will be by repeating these inspections in future years.

It should be clearly understood that the physical depreciation in all cases is based upon the reproduction cost new, and when this depreciation is deducted, the balance will not always represent the present value. Many pipe lines were originally constructed of second-hand material, and some of these have since been replaced by selected second-hand pipes from other lines. Some of the buildings and machinery also were second-hand. We were instructed to appraise at reproduction cost new, and have done so.

(d) "*Amount of depreciation to be deducted from historical cost.*" We interpret this to mean the amortization or retirement reserve.

COST OF MATERIALS AND CONSTRUCTION

For your information we submit data which we have collected and computed with regard to the fluctuations in the costs of materials and construction from 1909 to July, 1923. We believe this information will be helpful to the Board of Reference and others.

The editor of the "Engineering News-Record" of New York, has prepared a comprehensive tabulation of construction costs index numbers based on United States prices and accepted by State Commissioners as a reliable indication of the great fluctuations which have taken place. This tabulation follows.

The basic index number of 100 is adopted to represent the prices and costs which prevailed in the United States in 1913, and the index numbers for

subsequent years are calculated with reference to the 1913 standard. This provides a method by which present costs can be compared to those in the past. For example, to ascertain what a building which is estimated to have cost \$10,000 in July, 1923, would have cost in July, 1915, we refer to the following tabulation and observe that the index number for July, 1923, is 220.10 and that for July, 1915, is 90.51. Then \$10,000.00 divided by 220.10 and the dividend multiplied by 90.51 gives the result required, namely, \$4,112.22.

**"ENGINEERING NEWS-RECORD" CONSTRUCTION COSTS INDEX NUMBERS
1914 to 1923**

BASED ON STANDARD OF 100 FOR 1913

	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	
Jan.....	89.22	87.12	130.46	167.75	184.51	198.05	206.55	230.87	168.72	191.70	..... Jan.
Feb.....	89.22	87.36	134.46	167.75	185.51	201.50	225.10	230.67	168.72	197.40	..... Feb.
Mar.....	88.97	87.66	142.96	175.66	184.51	198.05	240.85	224.27	162.04	205.25	..... Mar.
April.....	87.97	90.16	147.31	183.41	186.01	191.25	265.20	213.07	164.72	213.50	..... April
May.....	88.62	90.16	148.86	187.61	186.01	191.25	268.90	210.82	164.62	216.70	..... May
June.....	87.87	88.96	146.51	199.26	186.31	191.85	273.80	209.82	166.62	220.70	..... June
July.....	88.12	90.51	145.76	204.01	188.65	193.65	265.65	203.82	169.70	222.10	..... July
Aug.....	90.11	91.76	146.56	198.41	193.85	196.65	252.00	193.07	173.40	221.50	..... Aug.
Sept.....	90.36	93.01	149.56	190.31	193.85	202.85	255.20	188.27	185.00	221.50	..... Sept.
Oct.....	88.51	96.16	152.91	167.11	193.85	202.25	255.20	182.57	188.60	220.30	..... Oct.
Nov.....	87.26	101.06	155.66	166.51	193.55	206.85	255.32	166.32	188.60	.....	..... Nov.
Dec.....	86.51	107.06	167.15	167.11	194.75	206.85	251.62	167.82	192.60	.....	..... Dec.
Average..	88.56	92.58	147.35	181.24	189.20	198.42	251.28	201.78	174.45		

Canadian Building Materials

As a further indication of the relative fluctuation in prices we submit a table supplied by the Dominion Bureau of Statistics with reference to all building materials.

**ALL BUILDING MATERIAL—STANDARD 100 in 1913
INDEX NUMBERS**

1906.....	93.4	1914.....	97.2	1923	
1907.....	97.5	1915.....	108.5	Jan.....	186.8
1908.....	94.5	1916.....	138.5	Feb.....	188.8
1909.....	93.4	1917.....	153.6	Mar.....	192.7
1910.....	100.5	1918.....	181.6	April.....	197.3
1911.....	106.7	1919.....	203.5	May.....	194.7
1912.....	102.6	1920.....	261.9	June.....	193.9
1913.....	100.	1921.....	208.9	July.....	193.1
		1922.....	179.4	Aug.....	192.8

Cost of Skelp

The material which involves the largest investment by the Gas Company is steel pipe which is made from plates called skelp. The following statistics have been extracted from the returns published by the United States Department of Labour.

Canadian Steel Prices

We have collected the data concerning the fluctuation of prices in Canadian steel pipes from 1914 to date. The average price per hundred pounds base for each year was computed, and the yearly index numbers were ascertained. As we had no information as to the volume of business in steel pipes, we could not weight the figures. Consequently, they are subject to slight corrections, but are, nevertheless, close enough for estimating purposes. The averages and their respective index numbers are as follows:—

Year	Cost per 100 lbs.	Index No.
1914.....	\$2.60	100
1915.....	2.68	103
1916.....	4.01	154
1917.....	6.22	239
1918.....	7.25	279
1919.....	6.37	245
1920.....	7.05	271
1921.....	5.63	217
1922.....	4.20	162
1923.....	4.73	182
July, 1923.....	5.00	192.5

Cost of Canadian Labour

We will have occasion to refer to the cost of Canadian labour, and, we therefore, submit the following table as being probably the closest indication that can be obtained. These figures are the index numbers of the average of several trades, etc., as published by the Canadian Department of Labour.

1906..... 78.7	1911..... 92.5	1916.....105.7	1921.....186.1
1907..... 83.6	1912..... 96.0	1917.....117.5	1922.....176.8
1908..... 85.0	1913.....100.0	1918.....139.8	*1923.....180.0
1909..... 85.9	1914.....101.4	1919.....160.4	*(Estimated)
1910..... 89.1	1915.....101.4	1920.....192.1	

When we deal with the actual cost of the different sections of work, we propose using the tabulations or charts as the only means available for making such estimates. The company's books have not been kept by such an accounting method as to reveal the segregated cost of the sections of work according to the requirements set out in the instructions.

GRAND SUMMARY OF APPRAISAL

We submit the summary of our appraisal in tabular form. Each section is referred to, and the data computed are presented. For details please refer to the succeeding pages.

UNION NATURAL GAS COMPANY OF CANADA, LIMITED

GRAND SUMMARY OF APPRAISAL AS ON JULY 31ST, 1923

	Total appraisal reproduction cost new	Probable actual cost	Accrued retirement reserve on total appraisal		Accrued physical depreciation off reproduction cost new	Depreciation from probable actual cost
			Straight line	Sinking fund 5 per cent.		
1 Leaseholds.....	\$1,774,128	\$300,000	.....	.....	.....	.....
2 Lands owned in fee.....	23,430	56,812	\$10,041	\$5,904	.....	\$150,000
3 Private rights of way and easements.....	14,468	14,468	6,200	3,646	.....	.....
4 Value of public franchises.....	.....	.....	.....	.....	.....	.....
5 Buildings and lots.....	133,813	70,560	38,232	22,477	\$22,914	12,100
Machinery.....	29,235	17,451	10,026	5,893	13,156	7,853
6 Payments on expired options.....	.....	.....	.....	.....	.....	.....
7 Wells and equipment, Hilbury field.....	1,090,664	765,000	429,240	245,243	312,200	215,000
" " Dover.....	250,609	272,730	55,156	37,306	18,060	22,273
" " Dawn.....	97,889	95,700	18,412	12,798	4,789	4,570
8 Compressor station.....	266,200	144,008	91,270	53,658	90,510	49,000
9 Collecting lines.....	210,384	147,520	62,539	37,413	45,491	31,707
10 Transmission lines.....	2,913,089	1,895,140	936,350	550,485	762,644	496,527
11 Distribution lines.....	334,297	201,650	119,900	66,612	70,678	42,347
12 Regulators and checking meters (main lines).....	86,399	56,300	27,770	16,330	17,280	11,260
13 Telephone lines.....	28,355	14,977	12,152	7,145	12,760	6,740
14 Services.....	68,380	35,500	29,305	17,229	17,095	8,875
15 Meters and regulators (domestic).....	185,031	96,270	55,509	33,572	59,210	30,806
16 Autos, horses, vehicles, etc.,.....	29,080	31,820	9,305	8,420	8,715	9,270
17 Tools and miscellaneous equipment.....	87,935	90,000	43,968	36,827	29,312	19,541
18 Offices and general equipment.....	10,944	9,000	2,432	1,556	3,283	2,700
19 Overhead and intangible expense.....	906,698	582,485	388,585	228,448	244,808	157,271
20 Working capital.....	388,540	388,540	174,270	105,399	174,270	174,270
Totals.....	\$8,929,568	\$5,285,931	\$2,520,662	\$1,496,361	\$1,907,175	\$1,452,120

LEASEHOLDS

The following is a list, supplied us by the officials, of the leases held by the Union Natural Gas Company, as on July 31st, 1923:—

LEASEHOLDS AS ON JULY 31st, 1923

Field	Acreage		Total acreage	Number of leases	
	Operated	Unoperated		Operated	Unoperated
Tilbury.....	8,938	2,858	11,796	104	83
Dover.....	1,480	3,561	5,041	4	7
Dawn.....	1,100	12,632	13,732	10	143
Miscellaneous.....		341	341		5
Total.....	11,518	19,392	30,910	118	238

The cost of obtaining and securing these leases, we are informed, averaged between \$8 and \$10 each. But the books record a number of payments, a few of which the late D. R. Roberts had noted. His notebook contains the following information:—

May 31	—Bonus on lease dated May 21, 1917.....	\$500.00
May 31	—Payment lease dated May 22, 1917, 216 acres, Township Raleigh....	2,000.00
June 25, 1917	—Bonus 20 acres, lot 3, front concession, Township Tilbury East.....	100.00
June 19	—Bonus for correction of lease on northeast half lot 2, concession II and southeast half lot 2, concession V, Dover East.....	500.00
June 27	—Bonus on gas and oil lease dated June 22, 1917, on lot 7, and south half lots 8, 9 and 10, concession I, Township Dover East, and consent to lease dated January 13, 1913, on west half lot 5, concession IV, and west half lot 5, concession III, and lot 6, concession III and IV, Township Dover West.....	25,000.00
June 29, 1917	—Paid for assignment of leases on Bradley farm, part lot 1, concession I, Raleigh, and Trudell farm, part lot 3, concession I, Township Tilbury East.....	2,500.00
June 5	—For lease given under date, May 28, 1917, for lots 4 and 5, concession V, and south half lot 3, concession V, and southwest 20 acres of northwest half lot 3, concession V, Tilbury East.....	
June 12	—Paid for rentals of Thames Valley Garden & Land Company leases (9) at 50 cents per acre.....	289.70
Aug. 16, 1917	—Company paid for bonus on 104 acres, part lot 2, front concession, Township Raleigh.....	2,000.00
	Bonus for lease part lot 1, front concession, Dover East.....	2,000.00
	Bonus on 76 acres of lot 1, and westerly 50 acres lot 2, concession I, Raleigh.....	400.00
	Bonus for lease part lot 1, concession I, Dover East.....	1,000.00
	Bonus for lease of lot 3, concession I, Raleigh.....	600.00
	Bonus for lease on part lot 4, concession I, Dover East.....	200.00
	Bonus for lease of part lots 4 and 5, front concession, Dover East....	500.00
	Bonus for lease of part lot 15, Paincourt Block, Dover East.....	100.00
Sept.-May	—Bonus, part lot 6, concession I, and part lot 6, concession II, Tilbury East.....	1,000.00
	Part lot 7, concession II.....	1,000.00
	Assignment east half lot 5, concession VI, Dover.....	1,000.00
June 18, 1918	—Bonus on west 86 acres, lot , front concession, Tilbury East.....	3,000.00
	A bonus, easterly 40 acres, lot 2, front concession, Township Tilbury East, lease of June 18, 1918.....	2,000.00
	Myers drainage, Dover.....	18,568.84

No doubt there are other instances of such payments.

It is, therefore, evident that the actual gross cost of the leases was much greater than \$8 per lease. A reference to the item, leaseholds, in Exhibit

iv appended to the statement on Historical Cost, page 9, will show that the expenditure on leaseholds since the Union Natural Gas Company was incorporated, has been \$112,000. What was the expenditure on leases previous to amalgamation, we cannot state, as the value of these was not segregated but included in the total amount paid.

We assume that the actual cost of the leases was about \$300,000, and the depreciation on the same would be about 50 per cent., or \$150,000.

Value on the Basis of the Gas in the Field

Before we can adequately discuss the value of leaseholds based on gas in place, it is necessary to explain the conditions and situation.

The Recoverable Residual Supply of Gas in the Tilbury Field

The Union Natural Gas Company had its origin in an amalgamation of three companies, and it appears that either the early records of rock pressures and open flows of the individual wells in the Tilbury gas field were not kept, or were never turned over to the Union Natural Gas Company. Neither did the Canadian Gas Company keep such records, excepting the original open flows. Very few records of rock pressure are available until the year 1919 when the Union Natural Gas Company purchased this field from the Canadian Gas Company.

We are also informed that many wells abandoned before the year 1917, do not appear in the records of the Canadian Gas Company; and the dry and abandoned wells drilled by some of the companies preceding the incorporation of the Union Natural Gas Company do not appear in the records from which our calculations have been made. No rock pressures or open flows are given for any wells at the time of this abandonment, although many "open flows" are recorded the year previous to such abandonment. Some of these measurements would no doubt lead to a decision to abandon specific wells. We have analyzed the record of thirty-four such abandoned wells to determine the point in their life at which they apparently ceased to be of commercial value and have found this to be when they averaged about 22,000 cubic feet per day open flow with an average rock pressure of 231 pounds.

For the above reasons we have commenced our calculations with the year 1915 when the first attempt to keep a complete record of the open flow and rock pressure of the field was made by the Union Natural Gas Company. It should be mentioned here that the rock pressure of only a number of representative wells was taken prior to 1921, in which year every well was tested. The pressure of selected wells would no doubt give a higher average than would be the case if a complete test were made, but if, as is most probable, none of the adjacent wells were shut in at the time, this would no doubt compensate, to some extent, and give a fair average working pressure of the field.

To the rock pressures as shown in Volume XXX, part 5, Department of Mines, Ontario, 1921, have been added the records of wells drilled later in the year and of some wells which were under repair or for some other reason not available for test at the time the pressures were taken. This raises the average rock pressure from 265 pounds to 277 pounds. The rock pressures of 1921 were

taken in the month of May, following the heavy demands of the winter when the pressure in the gas field was low. If the rock pressure had been taken in August, it would have been considerably higher. Wells were shut in for about twenty-four hours, and while it was natural to do so to some extent, no special effort was then made to group the wells.

The average pressure for 1923, namely 305 pounds, is very misleading and of very little use in estimating the residual supply of gas available at the present time. The pressure was determined after disconnecting wells from the gathering lines and plugging them for ten days. Groups of about forty wells were gauged simultaneously in this way. This is certainly an ideal method and the correct way of determining the maximum rock pressure in a gas field. Rock pressures, however, are useful only for the purpose of comparisons; but having regard to what has already been stated, there will be nothing to compare with this 1923 result until some time in the future. The rock pressures of 1923 have not been used in the present calculations. The rock pressure in 1922 was taken in August in about the same manner as it had been previously determined, and we believe that it may be accepted as a safe basis for calculation.

Another problem was met with in dealing with that portion of the field which was formerly owned by the Canadian Gas Company. As previously stated, the amount of gas sold from this field is known only from 1912 to 1919. With the exception of the original open flow of the wells, no record of the rock pressures or open flows was kept until 1919, and from that year to the present the records indicate only the aggregate volume of gas produced in this field and in that owned by the Union Natural Gas Company. The majority of readings from 1914 to 1919 were given to the nearest half million cubic feet, and in only twenty cases were the figures read to the nearest thousand cubic feet. Considering the personal factors involved in using and reading a pitot tube, we firmly believe that the computed open flows will be found reasonably comparable with those determined by actual observations.

A graph for each well was, therefore, plotted from the data of the original and 1919 open flows, and by interpolation the approximate open flows for the intermediate years were thus obtained. We believe these values are probably as reliable as those that might have been obtained by direct observation in the field during these years.

Dover Gas and Oil Field

Complete records of open flows and rock pressures in this field are not available. All but one well (No. 13) produce both oil and gas to such an extent that when taking rock pressures and open flows, the gas bubbling through the fluid causes such serious fluctuation in the recording instrument that no reliable measurement could be obtained. In the case of No. 13, the original open flow in 1917 and the subsequent one of 1923 have been recorded. The open flow curve has been interpolated from a graph based upon these measurements. With only these two reasonably accurate measurements as guides, the estimated future open flow is not reliable; it merely indicates what may occur if this well is kept for purposes of supply peak loads. The remainder of the oil wells, Nos. 1, 7, 12, 14, and 16, do not produce sufficient gas to raise the oil to the surface.

The oil is removed by pumping, and the gas from these wells is continuously fed into the mains to allow the oil to be recovered. This production of gas is very small; it is a negligible quantity, considering the total sales of the company. A rough approximation of the future production of all the wells is given in the table on page 26.

The future production has been based on the figures of 1920, 1921, and 1922. Instead of a decline in production in 1919, as would have been the case if well No. 13 had not been drilled, the production of this well in the last two months of the year brought the year's total over that of 1918. No. 13 was, no doubt, kept in the line during the whole of 1920, which resulted in the high production of the Dover field. The field was drawn upon only during the winter months of 1921 and 1922, as in the current year.

If the Dover field is reserved for peak load supply as at present, the future condition as indicated in the table may be predicted; but it is possible that when the shortage occurs in 1927 and 1928, the field will be drawn upon very heavily, and its future production will be diminished from that date. We would venture to estimate the total recoverable volume from the Dover field at about 1,000,000 thousand cubic feet, but the time element is a very uncertain factor, as the gas may be exhausted before the year 1930.

Retirement Reserve and Future Service

The time at which the Union Natural Gas Company may be compelled to discontinue business in different municipalities is fixed by two conditions:—

First, when the supply fails to meet the minimum demand for purposes similar to those for which manufactured gas is ordinarily used;

Second, when the charge to the consumer has reached a price at which he cannot afford to use the gas liberally and the producer cannot obtain sufficient returns to warrant continuing in business.

The production of the Dawn field has been purposely omitted from the following discussion concerning retirement reserve. It is understood that gas from this and the Dover field is now used only in the winter months and to supply peak demands turned on in extreme weather. Some of the oil wells in the Dover field are kept in the line throughout the year to allow the wells to produce oil. The Dawn field has been producing gas only from December, 1922, to April, 1923, when it was shut in during the summer months. No decrease in rock pressure or open flow can be recorded until a full year has elapsed. It is certain that these fields will not last longer than the Tilbury field and it is quite probable that the demand upon them may be so heavy as to cause them to become exhausted at a much earlier date. The following figures give an indication of the life of the Dover field:—

Field	Year	Rock pressure	Year	Rock pressure	Difference	Time in years
Tilbury.....	1910	568 lbs.	1923	260 (est.)	308 lbs.	13
Dover.....	1917	1,200 lbs.	1923	550	650 lbs.	6

The calculations below are based on actual conditions as they are known to exist in gas fields in other parts of Ontario.

Urban consumers use 6,075 cubic feet, rural consumers about 10,000 cubic feet, and free consumers (in Kent county now) about 55,000 cubic feet each per month in the winter when the demand is greatest. The production in nearly exhausted but dry fields is about one-third of the open flow, similar to that obtaining in the Tilbury field and in nearly all other fields. No records are available to compare these dry fields with the Tilbury field in its present condition, and it is not definitely known whether the production of a gas field is materially affected by the presence of water when such water is being removed by pumping. It is assumed that it is not.

It is desirable to formulate some idea as to the year in which the Tilbury field will be unable to satisfy the present minimum demand, ignoring for the present purposes the possibility of finding new gas fields.

The present consumers on the Union Natural Gas Company's lines are: urban, 21,610; rural, 3,200; and free, 152. The minimum demand in a winter month is 171,641 thousand cubic feet, which is equal to a daily total open flow of 17,164 thousand cubic feet, i.e., $\frac{171,641 \times 3}{30}$. If we consult the table on page 26, we find that in 1927 the open flow in the Tilbury field will be about 16,500 thousand cubic feet, and to this should be added the open flow of No. 13 Dover, making a total of 17,420 thousand cubic feet, which is just enough to supply the demand.

Either new fields must be found after the year 1926, or a supplementary supply must be provided, such as manufactured gas, or the number of consumers must be reduced.

The number of consumers that can be supplied with gas for cooking purposes only each year is shown in the column under that heading in the table on page 26. It is evident that certain main lines must be abandoned from time to time, but which shall be first or last is a matter outside the instructions given to us. The future retirement reserve should be so built up that any main line may be fully amortized by the time its usefulness in this connection terminates.

The field conditions after the year 1935, due to the danger of the field being flooded by salt water, are so problematical that we feel that it would be inexpedient to extend the calculations any further. Therefore, that portion of the Windsor line west of Tilbury Junction, the Sarnia line with its various branches, excepting the line connecting Petrolia to the Dawn field from which some gas might still be procured, the Ridgetown line to the field and the lines tributary to the Ridgetown line, must be retired before the year 1935. To consider 1940 as the final year to retire the remaining portion of the pipe lines and branches in Kent county in our opinion would be financially imprudent.

Operating expenses will no doubt have reached such magnitude by 1935, that the gross revenue will not be sufficient to continue carrying the retirement charges any longer. Ideal conditions such as have been assumed in preparing the table, would undoubtedly allow Chatham to be served with gas until 1940. We consider that the retirement reserve should be sufficient to retire the rate base by the year 1935.

The following table presents all essential data required in connection with this enquiry.

Year	Tilbury field										Dover field		No. of consumers that can be given service in winter months	Year
	New wells			Total at end of year			Production for year		Open flow No. 13 well	Production for year				
	No. of wells	Average per well		No. of wells abandoned	No. of producing wells	Total open flow	Average per well							
		rock pressure	open flow				rock pressure	open flow						
1914	30	lbs. (a) 496	M cu. ft. (e) 1,402	1	133	125,000	lbs. 491	M cu. ft.	8,295,781	M cu. ft.	170,000	24,952	1914	
1915	10	(b) 337	1,249	1	141	120,672	475	856	8,405,488	85	137,000	24,952	1915	
1916	18	(c) 428	1,512	2	149	101,477	434	681	10,008,568	681	113,000	24,952	1916	
1917	7	(d) 391	966	1	172	93,531	368	544	10,635,531	544	165,525	24,952	1917	
1918	2	.....	320	1	174	66,946	330	385	6,010,739	385	468,798	24,952	1918
1919	4	(b) 310	353	2	173	55,419	320	320	5,036,386	320	470,806	24,952	1919	
1920	.....	.....	.....	1	174	40,042	291	230	4,503,500	230	835,079	24,952	1920
1921	7	327	573	8	170	.....	277	.....	3,485,702	.....	275,351	24,952	1921
1922	3	410	311	14	159	.....	280	.....	3,385,141	.....	212,188	24,952	1922
1923	3	373	300	10	158	28,646	305	186	3,000,000	186	170,000	24,952	1923	
1924	.....	.....	.....	.....	.....	24,600	250	165	2,600,000	165	137,000	24,952	1924
1925	.....	.....	.....	.....	.....	21,400	236	147	2,300,000	147	113,000	24,952	1925
1926	.....	.....	.....	.....	.....	18,750	224	132	2,030,000	132	94,000	24,952	1926
1927	.....	.....	.....	.....	.....	16,500	213	119	1,820,000	119	88,000	24,952	1927
1928	.....	.....	.....	.....	.....	14,800	204	108	1,620,000	108	65,000	21,870	1928
1929	.....	.....	.....	.....	.....	12,400	195	97	1,450,000	97	55,000	19,788	1929
1930	.....	.....	.....	.....	.....	11,500	186	89	1,310,000	89	46,000	17,143	1930
1931	.....	.....	.....	.....	.....	10,200	178	81	1,180,000	81	38,000	15,041	1931
1932	.....	.....	.....	.....	.....	9,250	172	74	1,070,000	74	33,000	13,700	1932
1933	.....	.....	.....	.....	.....	8,350	165	68	975,000	68	29,000	12,000	1933
1934	.....	.....	.....	.....	.....	7,500	158	63	890,000	63	25,000	10,042	1934
1935	.....	.....	.....	.....	.....	6,800	152	58	820,000	58	21,500	8,670	1935
1936	.....	.....	.....	.....	.....	6,180	147	54	753,000	54	18,700	7,786	1936
1937	.....	.....	.....	.....	.....	5,630	142	50	693,000	50	16,200	7,000	1937
1938	.....	.....	.....	.....	.....	5,150	137	47	638,000	47	14,300	6,240	1938
1939	.....	.....	.....	.....	.....	4,700	133	44	590,000	44	12,500	5,600	1939
1940	.....	.....	.....	.....	.....	4,300	129	41	545,000	41	11,000	5,030	1940

The figures below the heavy line are estimates.

With further reference to estimating the quantity of gas in place, we submit that there is no satisfactory method of computing this.

The Pennsylvania Public Service Commission, when discussing the case of the *City of Erie vs. The Pennsylvania Gas Company* (May 24th, 1921), stated "that it is impossible to determine, in advance, the quantity of natural gas in theseheld lands or what can be obtained therefrom by searching and drilling," and "that gas holdings should be included and evaluated only to the extent that they represent developed, used and useful territory, including a reasonable reserve necessary for the continued functioning of the company in its public service. Such holdings should be included in the rate base at their present value, but this value cannot be determined on the basis of what gas can be sold for." Further on, the report states "that the amount remaining in the earth and the length of time the supply will last are matters of conjecture and of somewhat uncertain estimate." The commission allowed \$7,500,000 for about 52,732 acres, or about \$143 per acre of gas holding on which were about 494 wells. On this basis 11,518 acres in the Tilbury, Dover, and Dawn fields would amount to \$1,647,074.

The New York Public Service Commission on March 1st, 1921, in deciding the petition of the Republic Light, Heat & Power Co. Inc., stated that "difficulty arises from the impossibility of predicting when the supply will cease. Nature has not laid her cards on the table face up and the value of her hand is not seen."

The West Virginia Public Service Commission on December 19th, 1919, when dealing with the application of the United Fuel Gas Company, stated, "we would, indeed, be invading the realms of uncertainty of speculation and conjecture to place upon the applicant's acreage any such valuation for rate-making purposes as that claimed for it. In view of what has been said we do not feel justified in allowing as a capital charge a sum in excess of the actual investment cost of these leases."

We have, however, adopted the principle of appraising the estimated future production from the three fields in each year to 1935, at the arbitrary rate of ten cents per thousand cubic feet. We have no basis for adopting this rate excepting that five and ten cents have been submitted in previous enquiries. According to the instructions we received, we have to assess a figure for this appraisal, but the final rate will, of course, be fixed by the Board of Reference. The conversion of the annual totals into their respective present values has been computed as on July 31st, 1923, and in the aggregate these amount to \$1,774,128. The table on page 28, gives all the data in this connection and shows how the totals were computed.

On pages 29 and 30, four charts with explanations are submitted. These show for Tilbury Field, the total open flow, annual production, annual rock pressure, and decline of volume of gas in field.

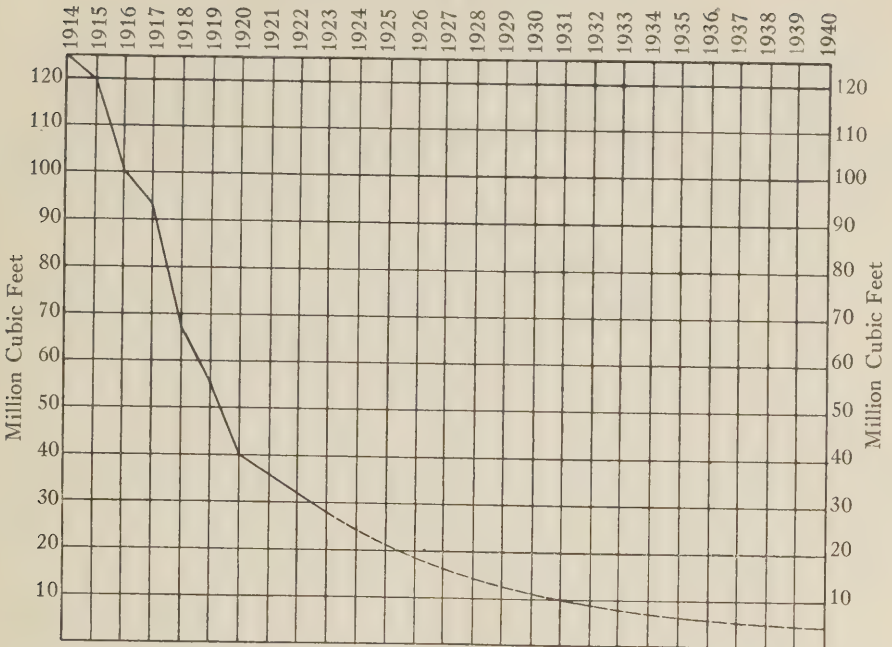
PRESENT VALUE OF GAS IN FIELD AS ON JULY 31st, 1923

Year	Number of years	Production Tilbury field	Production Dover field	Production Dawn field	Total production	Rate per M cu. ft.	Estimated value in each year	Present value per \$1.00	Total present value
1923.....	1½	M cu. ft. 1,500,000	M cu. ft. 85,000	M cu. ft. 42,500	M cu. ft. 1,627,500	Cents 10	\$162,750	\$1.00	\$162,750
1924.....	1	2,600,000	137,000	68,500	2,805,500	10	280,550	0.952	267,088
1925.....	2	2,300,000	113,000	56,500	2,469,500	10	246,950	0.907	223,984
1926.....	3	2,030,000	94,000	47,000	2,171,000	10	217,100	0.864	187,574
1927.....	4	1,820,000	88,000	44,000	1,952,000	10	195,200	0.823	160,650.
1928.....	5	1,620,000	65,000	32,500	1,717,500	10	171,750	0.784	134,652
1929.....	6	1,450,000	55,000	27,500	1,532,500	10	153,250	0.746	114,324
1930.....	7	1,310,000	46,000	23,000	1,379,000	10	137,900	0.711	98,047
1931.....	8	1,180,000	38,000	19,000	1,237,000	10	123,700	0.677	83,745
1932.....	9	1,070,000	33,000	16,500	1,195,000	10	119,500	0.645	77,077
1933.....	10	975,000	29,000	14,500	1,018,500	10	101,850	0.614	62,536
1934.....	11	890,000	25,000	12,500	927,500	10	92,750	0.585	54,259
1935.....	12	820,000	21,500	10,250	851,750	10	85,175	0.557	47,442
Allowing for balance after 1935, say,									100,000
Total.....									\$1,774,128

This is equal to \$154 per acre of operated gas holdings.

UNION NATURAL GAS CO. LTD.

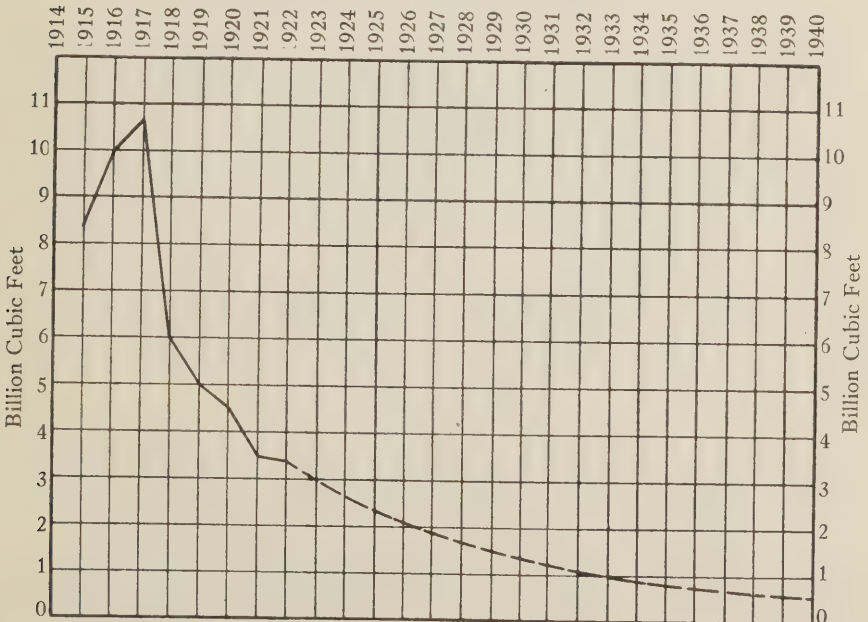
TOTAL OPEN FLOW OF THE TILBURY FIELD



In making the above graph the total open flows for the years 1916, 1918, 1919, and 1923 were used as a basis of the projection. This gives a very fair average, as 1917 and 1920 fall on either side of the curve. Note that in 1940 the total open flow has declined to 4,300 M. cubic feet while there is still 44 billion cubic feet of gas in the field.

UNION NATURAL GAS CO. LTD.

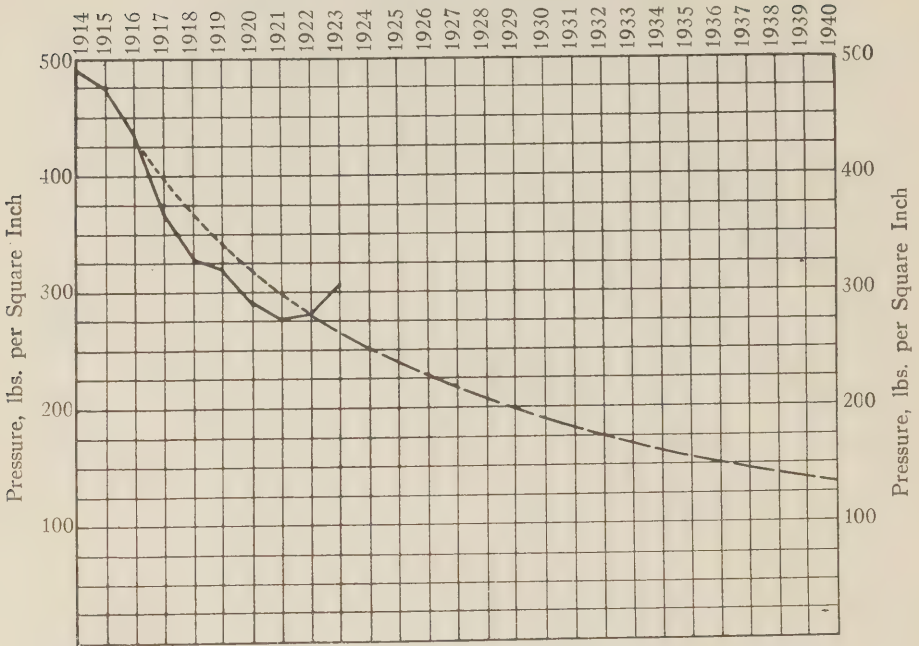
ANNUAL PRODUCTION OF THE TILBURY FIELD



In making this graph, the production for the years 1918, 1919, and 1922, was used for projecting the curve, the point representing the years 1920 and 1921 falling above and below this line respectively.

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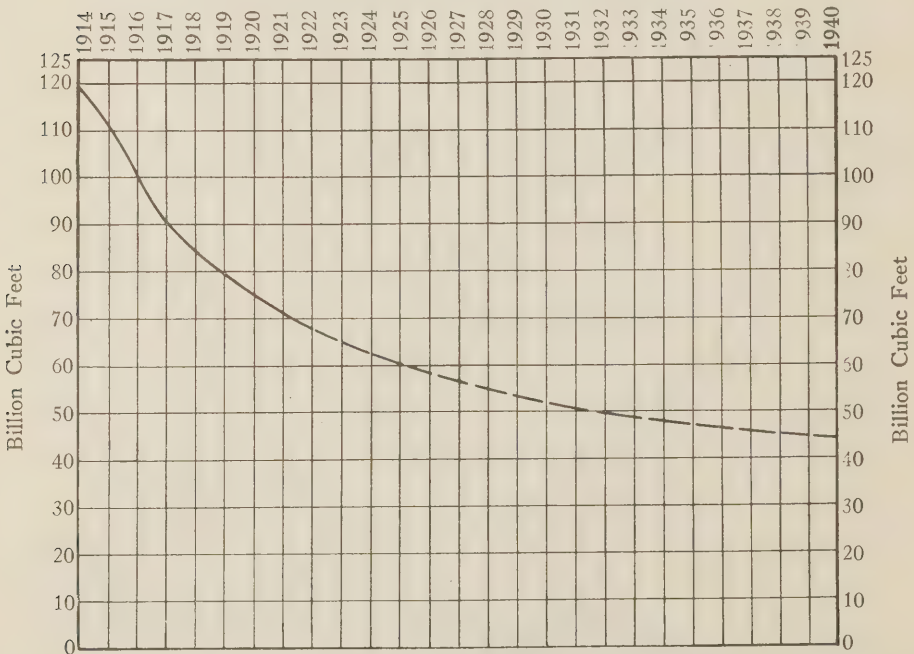
ROCK PRESSURE TILBURY FIELD, PAST AND FUTURE



As mentioned in the text of the report, the methods of taking rock pressures vary so much that only those that are comparable can be used. Following the year 1916 the field was undoubtedly drawn on to its capacity both summer and winter, and the pressure taken would be somewhat under the true rock pressure as taken in 1922.

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FUTURE DECLINE IN VOLUME OF THE TILBURY FIELD



This graph was made directly from the calculated table. Note how the decline in volume compares with the decline in rock pressure.

LANDS IN FEE

The Union Natural Gas Company own at Oil Springs:—

1 acre lot 28, range 29, part lot 17, concession II, which in 1914 cost.....	\$400
1 " " 35, " 13, " " 17, " II, " " "	1,000

The assessment is for 1½ acres at \$100.

ENNISKILLEN TOWNSHIP

1 acre lot 7, range 2, part lot 18, concession I, which in 1914 cost.....	300
1 " " 13, " 14, " " 18, " I, " " "	500
5 acres part of west half of lot 20.....	700

The assessment is \$250.

Total..... \$2,900

There are about 1,269 acres of land known as Empire land which were acquired for the purpose of prospecting for new gas wells. The venture did not prove successful; consequently, the land reverted to agricultural uses, and is believed to be owned by the Empire Land Company, which we understand is a subsidiary branch of the gas company, formed for the purpose of managing and selling the property.

The unsold land, including buildings and improvements, appears in the Empire Land Company account at \$53,911.92. A reserve for depreciation on buildings and improvements has been set aside and amounts to \$6,069.15. A statement prepared by Messrs. Clarkson, Gordon and Dilworth shows a debit balance of \$4,011.08, on the operations in 1922.

Having regard to the fact that these lands were acquired for the legitimate purpose of exploring for new supplies of gas, it appears reasonable that at least part of the expenditure should be allowed.

These lands have a certain value for agricultural uses, and we have appraised the same at \$55 per acre, or \$70,290. The question, however, is whether these lands should be included in the appraisal, inasmuch as they are not now used or useful for the purpose of the Union Natural Gas Company, and further, we believe the lands can be disposed of.

According to the practice of other authorities, items such as this are not included, and we are leaving the matter in the hands of the Board of Reference.

Depreciation

If it is decided to include these items, then there is a residual value, say two-thirds, leaving about \$23,430 to be retired.

This amount should then be retired on the basis of nine years, out of a total of twenty-one years. On a straight line theory, the accrued retirement reserve would amount to \$10,041.00; and on a five per cent. sinking fund, the amount would be \$5,903.51.

PRIVATE RIGHTS OF WAY AND EASEMENTS

The records show that the following rights of way have been secured:—

Pipe line	Number	Feet	Unit cost	Total cost
Sarnia line.....	126	174,000	1 year free gas \$45 each	\$5,670
Northern line.....	88	126,000	do	3,960
Ridgetown line.....	22	18,600	do	990
Windsor line.....	23	22,109	do	1,035
do	22	33,658	\$1 per rod	2,040
Chatham line.....	15	12,500	do	756
Tilbury pumphouse line.....	11	13,800	\$1 per way	11
Port Alma field line.....	6	7,720	do	6
Total.....				\$14,468

In the first four cases, the free gas is calculated on the basis of 300,000 cubic feet per year for each right of way, at 15 cents per thousand, that is \$45 per easement.

The value of the rights of way so far as we can judge is what was paid for them.

There is no physical depreciation in this case.

The accrued retirement reserve based upon nine years out of a total life of twenty-one years, will on a straight line basis amount to \$6,200, and on a five per cent. sinking fund basis, \$3,646.

PUBLIC FRANCHISES

The franchises granted by the various municipalities permitted the gas company to lay pipes in the roads and streets under certain restrictions and conditions. Without these franchises, the company could not operate and supply gas to their patrons. As these franchises were not acquired, but were granted under certain limitations, we do not regard them as assets for appraisal. If, however, the company has spent money in obtaining these franchises we would be prepared to allow the same, subject to the amount being approved.

BUILDINGS AND STRUCTURES

The following is a summary of the inventory of all buildings and lots excepting the compressor station and the regulator houses which will be dealt with farther on.

SUMMARY OF BUILDINGS AND LOTS

		Repro- duction cost new	Physical depreciation	
			Per cent.	Amount
Chatham				
48½ Market St.	land	\$ 2,700		
	buildings	11,000	10	\$1,100
23 Wellington St. E.	land	1,500		
	buildings	11,910	20	2,382
Blenheim	land	150		
	buildings	1,250	20	250
Ridgetown	land	300		
Tilbury				
Ella St.	land	100		
Canal St.	buildings	5,000	8	400
	land	500		
Dover	buildings	4,200		930
Windsor	land	2,500		
	buildings	1,250	10	125
Wallaceburg	land	300		
	buildings	7,340	20	1,468
10th line, Moore Township	buildings	50	25	12
Sarnia	land	750		
	buildings	3,250	20	650
Merlin	land	200		
	buildings	6,750	30	2,025
Northern	buildings	970	50	485
Gore	land	100		
	buildings	1,730	25	407
Port Alma	land	3,020		
	buildings	59,090	20	11,818
	watermains, sewers and sidewalks	7,187	10	719
Dover	buildings	716	20	143
Totals		\$133,813		\$22,914

The inventory of buildings and structures is given below.

Original Cost

Inasmuch as the expenditure incurred in connection with the buildings do not appear in the books in such a form as to be of use in this connection, we consider that the original cost can only be estimated by comparing the cost index number for the year 1914 with that of 1923.

The total reproduction cost new of the lots and buildings is \$133,813. The lots are appraised at \$12,120, and the buildings at \$121,693.

The "Engineering News-Record" index number for 1914 is 88.56, and for July, 1923, 222.10.

The probable original cost would, therefore, be $\$133,813 \times \frac{88.56}{222.10} = \$53,700$.

Using Canadian index numbers for building material (see page 17), we have 97.2 for 1914 and 193.1 for July, 1923. Therefore,

The probable original cost would, therefore, be $\$133,813 \times \frac{97.2}{193.1} = \$67,400$.

Using Canadian index numbers for building material as above, also Canadian labour index numbers of 101.4 for 1914 and 180 for July, 1923, and dividing the reproduction cost into the cost of labour and materials, we have:—

$$40 \text{ per cent. for labour is } \frac{40}{100} \times \$133,813 = \$53,525$$

$$60 \text{ per cent. for material is } \frac{60}{100} \times \$133,813 = \$80,288$$

$$\text{The probable original cost of labour would be } \$53,525 \times \frac{101.4}{180.0} = \$30,150$$

$$\text{The probable original cost of material would be } \$80,288 \times \frac{97.2}{193.1} = \$40,410$$

$$\text{Total probable original cost} = \$70,560$$

SUMMARY

Based upon "Engineering News-Record" index numbers. . . .	\$53,700
Canadian building index numbers.	67,400
Composite Canadian building and labour index numbers. . . .	70,560

Depreciation of Buildings and Structures

The annual physical depreciation of buildings and structures which are included in the list would be about three per cent. and, reckoning from 1914 to date, the total would therefore be about 27 per cent. on \$121,693, or about \$32,857.11; but, according to inspections, we have estimated it at \$22,914, which is evidently conservative. This is based on the assumption that the buildings were all new in 1914.

The amount required to restore the buildings to normal operating efficiency would be small because they appear to be effectual in their present condition.

With regard to the accrued retirement reserve on \$133,813, we estimate that the residual value of the buildings and lots after the gas fields have been exhausted, will be about one-third of the reproduction cost new. Consequently, the retirement fund for buildings and lots would be on \$89,209. The accrued retirement reserve on the straight line basis, retired in 9 years out of the total of 21 years of the life time of the gas fields, would be about \$38,232, and on the 5 per cent. sinking fund basis, \$22,477.

INVENTORY OF BUILDINGS AND LOTS

Item	Cost	Repro- duction cost new
CHATHAM		
48½ Market St., frontage 20 ft. to Market St., 24 ft. to rear line, and 93 ft. 6 in. to Wellington St., no basement, concrete block walls, wood floors, metallic ceilings, hot water heating, electric lighting, condition good.....	1914 \$8,000 plus cost of alterations	\$2,700 11,000
23 Wellington St. E., lot 62 ft. x 159 ft.....		1,500
Garage (part of old house), 16 ft. 6 in. x 28 ft., shingle roof....		1,000
Old house, 16 ft. 3 in. x 32 ft. 6 in., two storeys, shingle roof, verandah, 5 ft. x 28 ft., shingle roof.....		1,800
Garage, 14 ft. x 22 ft., shingle roof.....		500
Warehouse, 48 ft. 6 in. x 13 ft., wood floor, paroid roof.....	1907 \$2,000 plus cost of additions	1,250
Warehouse, 39 ft. x 13 ft., wood floor, paroid roof.....		1,000
Pipe and oil shed, 36 ft. x 16 ft., concrete floor, corrugated iron and wood building.....		1,000
Shop and garage, 62 ft. x 32 ft., two storeys, concrete floor, galvanized iron cover, wood lining, louvre ventilators, all wood frame, condition good.....		5,000
Yard, concrete, 180 sq. yds.....		360
BLENHEIM , lot 50 ft. x 100 ft., 1915.....	\$150	150
Office, 15 ft. 6 in. x 35 ft.....		800
Storehouse, 6 ft. x 10 ft.....		50
Storehouse, 12 ft. x 28 ft., all wood, fair condition.....		400
RIDGETOWN , at main regulator, lot only 33 ft. x 133 ft., 1921...	\$300	300
TILBURY , at Ella St. regulator, land only 25 ft. x 66 ft.....	\$50	100
Canal St., lots 120 ft. x 93 ft.....		500
Warehouse, garage and regulator house, new, 56 ft. x 16 ft., hollow tile walls, concrete floor, wood roof, paroid cover...	1922 \$2,200 plus cost of additions	1,000
Office and house, 42 ft. x 28 ft., two storeys, no basement, wood building recently extended and renovated, individual heaters, condition good.....		4,000
DOVER , 2 houses, 31 ft. x 35 ft., one storey, no basement, wood, paroid roof, fair.....		3,600
Garage and warehouse, 40 ft. x 16 ft., wood, new, rent of land \$20 per year.....		600
WINDSOR , lot 134 ft. x 199 ft.....	\$200	2,500
Office, 10 ft. 4 in. x 16 ft., wood, good condition.....		1,250
WALLACEBURG , lot 150 ft. x 325 ft.....	\$300	300
House, 22 ft. x 30 ft., two storeys, no basement, concrete block base, shingle roof, good condition.....		2,300
Tool house, 16 ft. x 12 ft. 6 in., fair.....		250
Leanto building, 10 ft. x 16 ft., shingle roof, fair.....		200
Wagon house, 20 ft. x 14 ft., corrugated iron and wood, fair...		450
Barn and stable, 20 ft. x 26 ft. 4 in., two storeys, wood, fair...		1,500
Leanto building, 12 ft. x 26 ft. 4 in., wood, fair.....		500
Warehouse, 15 ft. 6 in. x 40 ft., wood floor, fair.....		800
Garage, 12 ft. x 18 ft., metal roof, fair.....		340
Office, 20 ft. x 22 ft., with verandah, concrete block base, shingle roof, fair.....		1,000
10th LINE MOORE TWP. , old regulator house, now used as warehouse, 6 ft. x 10 ft., corrugated iron on wood, fair.....		50
SARNIA , lot 75 ft. x 157 ft.....	1909 \$120	750
House, 26 ft. x 32 ft., one storey and back addition, concrete block base, chimney poor, fair.....		1,700
Garage, 18 ft. x 18 ft., roof poor, otherwise fair.....		500
Toolhouse, 25 ft. 6 in. x 24 ft. 6 in., shingle roof, fair.....		700
Office, 18 ft. 3 in. x 10 ft. 4 in., shingle roof, fair, all wood buildings.....		350

INVENTORY OF BUILDINGS AND LOTS—*Continued*

Item	Cost	Repro- duction cost new
MERLIN , lot 64 ft. x 182 ft.		\$200
Stable and loft, 30 ft. x 21 ft., concrete, poor, old.		1,500
Leanto, 12 ft. x 20 ft., old.		300
Warehouse, 12 ft. x 36 ft. 6 in., wood floor, shingle roof, old. . .	1915	600
Toolhouse and garage, 18 ft. 6 in. x 60 ft., hollow tile, walls cracked, concrete floor, paroid roof, built 1916, fair.	\$2,500 plus cost of additions	1,500
Shed, 10 ft. x 8 ft., fair.		100
House, 32 ft. x 27 ft. 6 in., two storeys, attic and part basement, porch; back building, 30 ft. x 12 ft., one storey, concrete block base, fair; all wood except where otherwise stated. . .		2,750
NORTHERN , house, 30 ft. x 15 ft., one storey, wood, fair.		800
Stable, 8 ft. x 12 ft., one storey, wood, poor condition.		170
GORE , land, one acre.	1907	100
House, 22 ft. 6 in. x 15 ft. 5 in., two storeys, wood.		1,200
Shed, 10 ft. x 12 ft., one storey, wood.	\$200	200
Shed, 13 ft. x 14 ft. 8 in., one storey, wood.		330
All poor condition.		
PORT ALMA , land, 6.8 acres, 1912-16.	\$1,850	2,720
Office, 30 ft. x 16 ft., with 8 ft. verandah, good.		900
Machine shop, 43 ft. x 51 ft., brick walls, steel columns and trusses, concrete floor, paroid roof, hot water heating, electric light, good.		5,000
Barber shop, 12 ft. 4 in. x 10 ft. 4 in., wood, fair.		150
Four houses, formerly hotel, 25 ft. 6 in. x 80 ft. 6 in., two storeys, all wood, no basement, shingle roof, fair.		7,000
School, 24 ft. x 50 ft., all wood, paroid cover, fair.		1,000
Garage, 17 ft. x 40 ft., corrugated iron on wood, concrete floor, fair.		1,000
Warehouse, 24 ft. x 16 ft., brick walls, paroid roof, old, fair. . .		500
Barn, 16 ft. x 25 ft., two storeys, wood, fair.		1,200
Leanto, granary, 16 ft. x 9 ft., wood, fair.		200
Open shed, 14 ft. x 20 ft., wood, fair.		300
Toolhouse, 54 ft. x 18 ft., concrete base and floor, poor.		1,000
Warehouse, 22 ft. x 11 ft. 6 in., wood, poor.		400
Garage, 14 ft. x 12 ft., ready made, metal sheet cover, fair. . .		200
Field office, 14 ft. 3 in. x 18 ft. 6 in., shingle roof, wood floor, shelves, etc., fair.		450
House (Getty), 18 ft. 6 in. x 22 ft. 6 in., with leanto, 20 ft. x 10 ft., two storeys, no basement, on base, old and poor.		2,100
House (J. Charlton), 27 ft. x 18 ft., two storeys, with leanto, 16 ft. x 23 ft., one storey, 6 ft. verandah, good.		2,300
House (Hoskell), 24 ft. 8 in. x 16 ft. 6 in., one and a half storeys; 16 ft. x 12 ft., one storey, concrete base, no verandah, old and fair.		1,400
House (A. Charlton), 22 ft. x 30 ft., two storeys, leanto, 16 ft. 6 in. x 10 ft., side porch, concrete base, good.		2,500
Barn and loft, 21 ft. 6 in. x 16 ft. 6 in., two storeys; leanto, 14 ft. x 20 ft. 6 in., one storey, old, dilapidated.		1,500
Cottage (Smith), 20 ft. 6 in. x 17 ft., one storey, 14 ft. x 13 ft. 6 in., one storey, all wood, poor.		1,000
Cottage (Bird), 31 ft. x 16 ft., one storey; 10 ft. 9 in. x 8 ft., one storey, all wood, good.		1,000
Cottage (Tebbo), same as Bird's, fair.		1,000
Cottage (Cortwell), 22 ft. x 28 ft. 6 in., one storey; verandah, 16 ft. 6 in. x 8 ft. 6 in., one storey; part basement, bath, good		1,400
Cottage (Hassard), 18 ft. 6 in. x 28 ft. 6 in., one storey; verandah, 13 ft. 6 in. x 6 ft. 3 in., one storey, shingle roof, part base- ment, bath, good.		1,300
House (Cress), 20 ft. x 34 ft., two storeys, 7 ft. verandah, full basement, concrete base walls, shingle roof, bath, etc., good		2,750
House (McCardy), 26 ft. x 30 ft., two storeys, 8 ft. verandah, 17 ft. x 17 ft., one storey, concrete walls, full basement, bath, etc., good.		3,500

INVENTORY OF BUILDINGS AND LOTS—*Continued*

Item	Cost	Reproduction cost new
PORT ALMA —Continued		
House (Jenkins), same as McCardy, plus one dormer window in attic, good.....		\$3,500
House (H. Charlton), same as McCardy, plus two dormer windows in attic, good.....		3,600
Warehouse, 39 ft. 2 in. x 18 ft. 4 in., half loft, paroid roof, good.....		1,200
Garage, 18 ft. 2 in. x 16 ft. 2 in., paroid roof, good.....		400
<i>N.B.—All houses have individual heaters and electric light; all wood except where otherwise stated.</i>		
40 gallon fire engine (chemical) by American La France Engine Co.....		300
One small house for same.....		40
One water lot, 40 ft. x 350 ft., rent, \$15 per year.....		300
One elevated 50,000 gallon water tank, wood stave on steel supports, on concrete bases.....		4,000
One water pump-house, circular, 30 ft. diameter, concrete walls, wood roof.....		5,000
Watermains and intake.....		3,500
Services.....		160
Tile drains.....		850
Sewers.....		1,550
Concrete sidewalks.....		1,127
DOVER , warehouse, 20 ft. x 19 ft.....		350
Toolhouse, 12 ft. x 29 ft.....		300
Pumphouse, 8 ft. x 12 ft.....		66
Total.....		\$133,813

NOTE.—The compressor station will be referred to separately. Huts for regulators and meters are included with the same.

Machinery—Port Alma

While we are discussing the building and structures at Port Alma, it may be desirable to make an analysis of the machinery and equipment there, apart from the compressor station and plant.

The following is a list of machinery at Port Alma:—

Quantity	Item	Cost	Reproduction cost new
Waterworks			
3	3 in. Providence centrifugal pumps, double stage, with 15 H.P. electric motors, starters and compensators..	\$1,800	\$2,500
1	4 in. centrifugal pump with 35 H.P. electric motor, starter and compensator.....		1,300
1	Alcohol cylinder, 4 ft. x 14 in. diameter, with caps.....		20
Machine Shop			
1	20 H.P. electric motor with starter and compensator, 35 ft. belting, countershafting		550
1	20 H.P. horizontal gas engine with 30 ft. belting.....		800
1	Five-cell (wet) storage battery (poor).....		200
1	Turner-Fricke 75 H.P. vertical gas engine, 3 cylinder...		5,600
1	Generator set, 15 volts, 66 amps., and 2 H.P. motor....		250
2	Ridgeway generators, 50 K.V.O.....	2,850	4,000
2	Ridgeway 5 K.W. exciters with 24 in. belt.....		700
1	5-panel switchboard.....		1,300
1	15 H.P. electric motor, starter and compensator, and 30 ft. 6 in. belting.....		450

MACHINERY—PORT ALMA—*Continued*

Quantity	Item	Cost	Reproduction, cost new
	Machine Shop—Continued.		
1	Barnes 22½ in. upright drill with countershafting and belts.....	\$175	\$400
1	Power hack saw with belt and shafting.....		60
2	No. 4 emery wheels with shafting and belt.....		90
1	No. 1172 Merrell pipe cutting and threading machine with countershafting and belt.....		900
1	16 in. second-hand Davis shaper.....		850
1	16 ft. McCabe lathe, countershafting and belt, 36 in. swing.....	1,547	4,000
1	10 ft., 18 in. swing, Sebastian lathe with countershafting and belt.....		1,000
1	Canton portable crane No. 3, 2½ ton.....		160
	Main shafting with 6 brackets and 14 pulleys, belts, etc.....		300
1	20 H.P. electric motor for air compressor.....		550
1	8 x 8 x 100 Ingersoll Rand air compressor.....	782	850
1	½ H.P. motor grinder for lathe.....		60
3	Transformers, each 3 K.V.A.....		200
1	Overhead travelling rail, 60 ft. with differential block.....		75
2	Hot water heaters with five radiators.....		1,300
1	Forge.....		70
1	Air storage steel tank, 4 ft. x 15 ft., and connections.....		500
	Beams, hangers, etc.....		200
	Total.....		\$29,235

Original Cost.—We have consulted a number of firms who deal in machinery, and opinions were expressed that the general prices in 1914 were from 50 to 65 per cent. of the present prices, while some ranged as low as 35 per cent., depending upon the type and class of machinery involved. In order to be conservative in our estimate, we have adopted 60 per cent.

$$\text{Approximate cost in 1914} = \$29,235 \times \frac{60}{100} = \$17,451$$

The physical depreciation in machinery is about five per cent. per annum, so the aggregate for nine years will be about \$13,156.

The accrued retirement reserve of the machinery, less a residual value of twenty per cent. of the reproduction cost new and based upon the lifetime of the gas fields, would be about \$10,026, on the straight line basis, or \$5,893 if calculated on a five per cent. sinking fund basis.

**PAYMENTS, ANNUAL OR OTHERWISE, FOR TAKING AND HOLDING
OPTIONS IN RESPECT OF LANDS AND LEASEHOLDS
NOT NOW OWNED BY THE COMPANY**

So far as we can ascertain, the following represents the leases not now owned by the Union Natural Gas Company. This list dates from January 1st, 1912.

Field	No. of leases	No. of acres
Oil Springs.....	750	58,061
Strathroy.....	216	20,184
Delaware.....	94	5,920
Dover.....	292	27,410
Tilbury.....	330	25,903
Dawn and others.....	295	20,643
Total.....	1,977 leases	158,121 acres

These leases appear to have cost an average of \$8 per lease, plus bonuses, etc., of which we have no particulars; but after making enquiries, we believe about \$1 per acre would indicate an approximation of the cost, that is about \$158,121.

As these leases have expired and are no longer included as actual assets, we did not make an appraisal of the same.

WELLS AND EQUIPMENT

Tilbury Field

We have collected many data in regard to wells which we now present in tabular form.

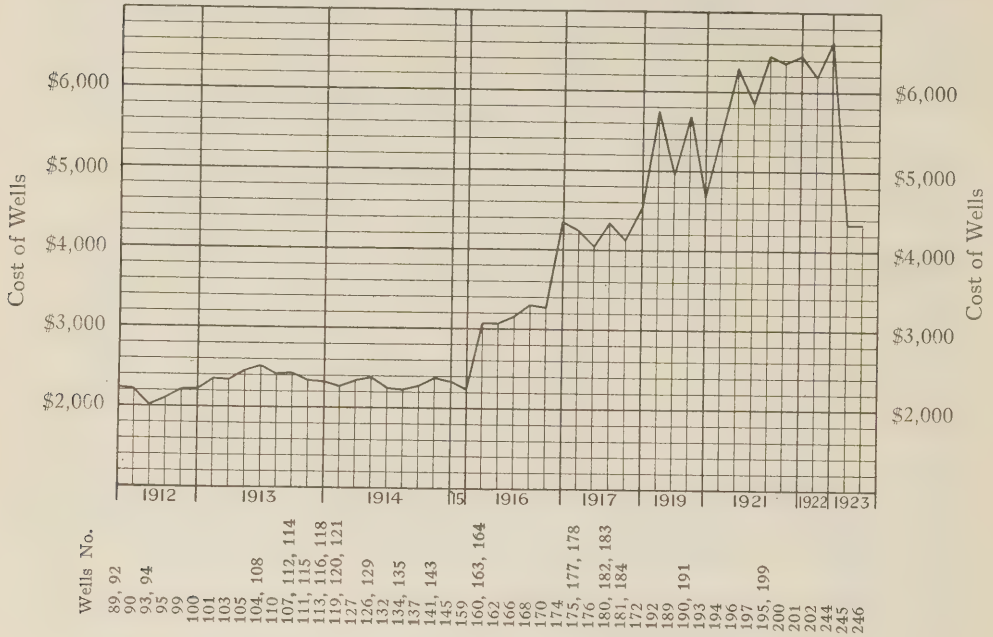
The cost of drilling and casing some of the wells, so far as recorded in the company's books, is shown in the table on pages 44 to 49.

The Union Exploration Company undertook to drill wells at a definite price of \$2.50 per foot. No. 192 was drilled by them, and although the cost is shown as \$5,765.25, the actual cost to the Exploration Company is stated to be \$7,944.45.

The Union Exploration Company also drilled the following wells in 1921 and 1922; the charge to the Union Natural Gas Company and the cost to the Union Exploration Company are both shown below:—

No.	Cost to Union Natural Gas Co. exclusive of pipes	Cost to Union Exploration Co. exclusive of pipes	Cost of pipes
194	\$3,365.00	\$5,419.14	.....
195	3,492.50	2,144.16	\$2,919.72
196	3,352.50	2,856.98	2,938.09
197	3,357.50	2,394.23	2,485.90
199	3,500.00	1,756.93	2,961.80
200	3,472.50	2,569.10	2,895.33
201	3,500.00	1,825.41	2,931.10
202	3,325.00	1,373.68	2,870.43
244	3,525.00	1,747.27	3,076.95

CHART SHOWING FLUCTUATION IN COST OF UNION NATURAL GAS COMPANY'S WELLS
TILBURY FIELD.



Tilbury Wells

The following is a tabulation of the data which has been collected with regard to the Tilbury wells. Where data were not available, we filled in the blank with our estimates as indicated.

The cost of drilling per foot has ranged from 80 cents in 1912 to about \$2.50 in 1923.

There are 160 producing wells in Tilbury field, and the present reproduction cost new is computed as follows:—

SUMMARY OF TILBURY WELLS AND EQUIPMENT

Item	Quantity	Unit price	Reproduction cost new
Drilling.....	221,155 ft.	\$2.50	\$552,887.50
Engines, pumps and fittings.....	97	1,001.95	97,189.15
Engines and pump jacks, etc.....	7	.....	2,000.00
Huts.....	97	32.00	3,104.00
Well heads.....	56	76.14	4,263.84
12 in. drive pipe.....	155 ft.	3.15	488.25
10 in. do.....	24,213 ft.	2.20	53,268.60
8 in. do.....	2,319 ft.	1.60	3,070.40
8 1/4 in. casing.....	26,723 ft.	1.38	36,877.74
6 5/8 in. do.....	16,616 ft.	1.30	21,600.00
6 1/4 in. casing.....	94,366 ft.	.80	75,492.90
5 5/8 in. do.....	11,479 ft.	.72	8,264.88
4 in. tubing.....	53,529 ft.	.67	36,132.07
3 in. do.....	168,212 ft.	.52 1/2	97,761.30
Anchor packers.....	160	45.00	720.00

SUMMARY OF TILBURY WELLS AND EQUIPMENT—*Continued.*

Item	Quantity	Unit price	Reproduction cost, new
2 in. pump tubing.....	1,400 ft.	\$0.25	\$350.00
1½ in. do	139,717 ft.	.18½	25,847.65
1 in. do	9,517 ft.	.14	1,332.38
¾ in. do	1,395 ft.	.08	111.60
Inserting pipe.....	160	30.00	4,800.00
Drips.....	53	70.00	3,710.00
Drips.....	26	100.00	2,600.00
1½ in. syphons.....No. 1	1,400 ft.	.18	259.00
1 in. do	12,600 ft.	.14	1,764.00
8 bbl. tanks.....No. 9	97	15.00	1,455.00
60 bbl. tanks.....	1	.....	80.00
250 bbl. do	1	.....	200.00
40 bbl. do	2	50.00	100.00
Tubing clamps.....	48	8.00	384.00
2 in. water lines.....	7,639 ft.	.30	2,210.70
1½ in. do	7,604 ft.	.20	1,420.80
1 in. do	449 ft.	.13	58.37
1½ in. stop cocks.....	97	2.24	219.52
			\$1,040,663.63
Allowance for dry wells.....			\$50,000.00
Total.....			\$1,090,663.63

NOTE:—Collecting lines will be dealt with later.

Actual Cost—Tilbury Wells

With reference to instructions to give the actual cost of producing wells and equipment, we believe the most reliable method of arriving at an approximation will be to adopt the index numbers already given on page 19, with regard to steel pipes. Inasmuch as steel pipes and fittings enter largely into the cost of the wells, we consider these index numbers will give an indication of the actual cost. To enable those interested in the method adopted, in this case we will give the process of calculation in detail.

The index number for all wells, etc., drilled in 1914 and prior is the standard of 100.

Year	Wells	Index number	Multiple
1914 and prior.....	105	100	10,500
1915.....	7	103	721
1916.....	13	154	2,002
1917.....	15	239	3,585
1918.....	2	279	558
1919.....	5	245	1,225
1920.....	0	271	.....
1921.....	7	217	1,519
1922.....	3	162	486
1923.....	3	182	546
Totals.....	160		21,142

$$\text{Average index number} = \frac{21,142}{160} = 132, \text{ compared with } 192.5, \text{ the number for July 31, 1923.}$$

$$\text{Approximate actual cost} = \$1,040,664 \times \frac{132}{192.5} = \$715,000.$$

This estimate is made on the assumption that all the equipment was new when installed.

Depreciation of Wells and Equipment—Tilbury Field

The amount required to restore the wells and equipment to normal operating efficiency is small if we interpret the phrase to imply general conditions. The only expense we consider necessary would be that of drilling and equipping more wells to maintain a satisfactory supply of gas.

With regard to the physical depreciation we consider that it would be about 30 per cent., or \$312,200, assuming that new equipment was used throughout.

Retirement Reserve—Tilbury Field

Out of the record of 234 wells drilled in the Tilbury field,

160 are producing

45 are abandoned

29 were dry.

It may be useful to submit an analysis of the life of the wells in this field as recorded in the books:—

Year	Number of wells drilled	Wells producing in 1923	Wells since abandoned	Dry wells	Life of abandoned wells	Average rock pressure
					years	lbs.
1906.....	8	1	1	6	13	530
1907.....	19	6	4	9	14	505
1908.....	16	9	3(b)	4	12	540
1909.....	26	20	6	.....	10	575
1910.....	10	7	1(a)	2	11	535
1911.....	20	14	5	1	14	532
1912.....	15	12	2	1	8	512
1913.....	21	17	4	.....	8	495
1914.....	32	19	11	2	6	468
1915.....	10	8	2	.....	6	432
1916.....	17	13	4(c)	.....	5	368
1917.....	19	16	1	2	3	328
1918.....	3	1	1	1	3	318
1919.....	4	4	.....	.....	.....	290
1920.....	.....	.....	.....	.....	.....	.....
1921.....	8	7	.....	1	.....	265
1922.....	3	3	.....	.....	.....	272
1923.....	3	3	.....	.....	.....	.....
Totals..	234	160	45	29	.....	.....

(a) Two additional wells were sold in this year when no longer useful.

(b) One well of Canadian Gas Co.

(c) One additional well sold when no longer useful.

It would appear that as the gas field becomes exhausted, so does the period of operation of a well diminish. Consequently, more wells will have to be drilled to replace abandoned ones and maintain the supply.

The reproduction cost new of wells and equipment should be spread over the estimated life of the field from its commencement.

Reproduction cost new.....	\$1,090,664
Less 30 per cent. residual value of equipment.....	146,333
Reproduction cost new, less residual value.....	\$944,331

The average year of producing wells is 1913. Therefore, the average life to 1935 will be 22 years of which 10 years have expired.

On the straight line basis the accrued retirement reserve would be:

$$\$944,331 \times \frac{10}{22} = \$429,240$$

On a 5 per cent. sinking fund basis it would be:

$$\$944,331 \times 10 \times 0.02597 = \$245,243$$

Abandoned wells are those which have been producing gas for a period and are now abandoned because the supply is exhausted, or possibly for other reasons. Inasmuch as the company has derived revenue from such wells, we have not set any appraisal on the same.

In the case of *Dry wells*, however, the position is different. The drilling of wells which prove to be dry, represents the use of so much capital which is unprofitable, but it is one of the hazards peculiar to this type of business. We consider the cost of drilling of dry wells together with the cost of irrecoverable casings, packers, etc., should be considered as a part of the cost of the producing wells, and have accordingly allowed \$50,000 in the summary of Tilbury wells.

DRY WELLS—TILBURY FIELD

Well No.	Date drilled	Total depth	Well No.	Date drilled	Total depth
1	Aug. 1906	ft.	24	Mar. 1908	ft.
2	Sept. 1906	1,408	27	July 1908	1,436
3	Oct. 1906	1,409	30	Oct. 1908	1,441
4	Sept. 1906	1,420	32	Nov. 1908	1,400
5	Nov. 1906	1,415	45	May 1910	1,450
6	Jan. 1907	1,414			.....
8	Jan. 1907	1,406	48	Oct. 1910	1,456
9	Nov. 1906	1,815	70	Jan. 1911	.....
10	Feb. 1907	1,441	96	Aug. 1912	.....
11	April 1907	1,442	124	Jan. 1914	.....
		1,443	125	Jan. 1914	.....
12	Mar. 1907	1,456	185	May 1917	1,400
15	May 1907	1,443	186	Fall 1917	1,400
16	May 1907	1,412	187	May 1918	1,400
17	May 1907	1,411	198	Aug. 1921	1,410
19	July 1907	1,404			

29 wells averaging 1,420 feet deep, which at the present cost of drilling would have involved an expenditure of about \$102,950, exclusive of lost pipes, plugging, etc., but the actual cost of which would have been about \$51,475, exclusive of lost pipes, etc. We have allowed \$50,000 for these wells.

TILBURY FIELD—

No. Well	Date Drilled	Depth	Pump	Eng.	Well head	Drive pipe		Casing			Tubing		Pump tubing		
						8 in.	10 in.	8 1/4 in.	6 5/8 in.	6 1/4 in.	3 in.	4 in.	1 1/2 in.	2 in.	3/4 in.
		ft.				ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.
14	.....1907	1,365			W.H.	143				815		1,368			
20	Aug., 1907	1,335	OWS	OWS		163				780	1,338		1,335		
22	Dec., 1906	1,350	OWS	OWS		148			5 1/8-875		1,355		1,350		
23	Jan., 1908	1,225			W.H.	164		196		800		1,185		1,185-1 in.	
28	Mar., 1908	1,380	OWS	OWS		160		220		780		1,382	1,380		
29	.....1907	1,455			W.H.	156		228	5 1/8-787		1,458				
31	Nov., 1908	1,390	OWS	OWS		186				745		1,393	1,390		
35	April, 1909	1,397	OWS	OWS		173		233		796		1,402	1,400		
37	July, 1909	1,394			W.H.	172		240		786	1,399				
38	Aug., 1909	1,387	OWS	ECL		160				760		1,389	1,385		
39	Aug., 1909	1,255			W.H.	170		210		780	1,265				
41	Sept., 1909	1,394			W.H.	179		220		794		1,395			1,395
43	Dec., 1909	1,399			W.H.	150		330		880	1,410				
47	Mar., 1909	1,438	OWS	ECL		(10 in.-254 } 12 in.-155 }		808			1,440		1,438		
50	Feb., 1911	1,365	OWS	ECL		165		220		780		1,368	1,365		
51	Mar., 1911	1,401	OWS	ECL			183	254		785	1,412		1,410		
52	April, 1911	1,395	OWS	ECL			193	208		790	1,401		1,400		
53	April, 1911	1,385	OWS	OWS			180	270		780	1,389		1,385		
56	May, 1911	1,387	OWS	ECL			174	250		788		1,390	1,385		
58	July, 1911	1,387			W.H.		185	193		761		1,379		1375-1 in.	
59	July, 1911	1,345	OWS	ECL			190			776		1,345	1,340		
60	Aug., 1911	1,390			W.H.		187	210		751	1,400			1397-1 in.	
61	Aug., 1907	1,390			W.H.		145	225		778	1,405				
62	Oct., 1907	1,415			W.H.		150	225		780	1,415				
64	July, 1910	1,366	OWS	OWS			(Est.)	(Est.)		(Est.)	1,370		1,366		
65	Jan., 1910	1,369	OWS	OWS			150	220		770					
66	Sept., 1910	1,409	OWS	ECL			180	225		780		1,373	1,370		
67	April, 1911	1,330			W.H.		140	210		750		1,334	1,410		
68	Jan., 1911	1,400	OWS	ECL			170	220		780		1,400	1,396		
69	Sept., 1910	1,305	OWS	ECL			140	200		750	1,300		1,296		
72	July, 1911	1,398	OWS	ECL			170	230		780		1,400	1,395		
73	Feb., 1910	1,420			W.H.		180	225		780	1,424				
74	Aug., 1910	1,390	OWS	ECL			160	220		780		1,374	1,370		
75	Dec., 1910	1,391	OWS	ECL			160	220		780	1,391		1,388		
76	Feb., 1911	1,364	OWS	ECL			150	210		770		1,366	1,362		
77	Nov., 1909	1,400	OWS	OWS			170	210		780	1,396		1,392		
78	Jan., 1908	1,345	OWS	ECL			150	210		750		1,348	1,400		
79	Aug., 1908	1,400	OWS	OWS			170	210		780		1,392	1,390		
80	Oct., 1909	1,405	OWS	ECL			170	225		780	1,393		1,390		
81	July, 1909	1,410	OWS	ECL			180	225		780	1,409		1,405		
82	April, 1909	1,393	OWS	ECL			180	220		780	1,380		1,376		
83	May, 1909	1,403	OWS	OWS			180	220		780	1,406		1,402		
84	April, 1909	1,420	OWS	OWS			180	225		790	1,385		1,382		
85	Aug., 1909	1,351	OWS	OWS			160	210		760		1,351	1,350		
87	Oct., 1909	1,412	OWS	ECL			180	220		780		1,405	1,400		
88	.....1912	1,386			W.H.		180	210		760	1,386				
89	Jan., 1912	1,424	OWS	OWS			161			822	1,443		1,440		
90	May, 1912	1,370	OWS	ECL			162	251		785	1,396		1,370		
91	July, 1909	1,407	OWS	ECL			(Est.)	(Est.)		(Est.)		1,411	1,407		
92	Jan., 1912	1,375	OWS	ECL			180	220		780					
93	July, 1912	1,390	OWS	OWS			157	170		770	1,402		1,390		
94	July, 1912	1,386	OWS	ECL			158	200		770	1,398		1,386		
95	Aug., 1912	1,391	OWS	OWS			155	211		780	1,407		1,390		
99	Oct., 1912	1,412			W.H.		135	290		805	1,409				
100	Nov., 1912	1,392			W.H.		175	290		812	1,412				

PRODUCING WELLS

Coll. lines		Surf. or bur.	Drip	Hut	Syphon	Tank	Water line			Open flow 1923	Rock pressure 1923	Cost	Average	No. Well
2 in.	3 in.						1 in.	1 ½ in.	2 in.					
ft.	ft.					bbl.	ft.	ft.	ft.	M cu. ft.				
.....	168	.....	.....	.....	.....	8	.....	240	.....	66	328	.....	.....	14
.....	279	.....	D.	F.	.....	8	.....	18	171	310	255	.....	.....	20
.....	177	.....	D.	F.	.....	8	.....	.....	.....	(B) 230	298	.....	.....	22
.....	144	.....	D.	.....	1 in. S.	.....	.....	.....	.....	302	230	.....	.....	23
1 ½-222	1,671	S.	D.	P.	.....	8	.....	240	.....	188	267	.....	.....	28
.....	2,045	S.	.....	.....	.....	.....	.....	.....	.....	14	425	.....	.....	29
.....	186	.....	D.	P.	.....	8	.....	186	.....	(B) 90	228	.....	.....	31
240	40	.....	D.	F.	.....	8	.....	15	.....	188	260	.....	.....	35
.....	312	B.	.....	.....	.....	.....	.....	.....	.....	(B) 11	293	.....	.....	37
.....	153	.....	D.	F.	.....	8	.....	144	.....	97	208	.....	.....	38
.....	162	.....	D.	.....	.....	.....	.....	.....	.....	1,143	297	.....	.....	39
.....	264	.....	D.	.....	1 in. S.	.....	.....	.....	.....	93	275	.....	.....	41
3,630	.....	S.	D.	.....	.....	.....	.....	.....	.....	20	485	.....	.....	43
.....	150	.....	D.	F.	.....	8	.....	540	.....	147	380	.....	.....	47
.....	333	.....	.....	F.	.....	8	.....	330	.....	193	268	.....	.....	50
.....	100	B.	D.	P.	.....	8	.....	.....	100	79	317	.....	.....	51
.....	264	B.	D.	F.	.....	8	.....	210	.....	83	342	.....	.....	52
.....	780	.....	D.	P.	.....	8	.....	20	.....	(A) 283	283	.....	.....	53
.....	1,690	.....	D.	F.	.....	8	.....	20	.....	203	258	.....	.....	56
.....	591	B.	D.	.....	1 in. S.	.....	.....	.....	.....	631	393	.....	.....	58
.....	588	B.	.....	F.	.....	8	.....	20	.....	647	376	.....	.....	59
.....	441	B.	D.	.....	1 in. S.	8	.....	.....	.....	1,377	362	.....	.....	60
234	228	.....	D.	.....	.....	8	15	.....	.....	(C) 20	.....	.....	.....	61
.....	186	.....	D.	F.	.....	8	.....	20	20	(C) 208	264	.....	.....	62
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	64
204	.....	.....	D.	F.	.....	8	.....	204	.....	19	282	.....	.....	65
600	.....	B.	D.	F.	.....	.....	.....	600	.....	47	460	.....	.....	66
.....	2,382	B.	D.	.....	.....	.....	.....	.....	.....	250	267	.....	.....	67
.....	1,743	.....	D.	F.	.....	8	.....	20	.....	139	285	.....	.....	68
.....	666	.....	D.	F.	.....	8	.....	20	.....	54	343	.....	.....	69
.....	534	.....	D.	F.	.....	8	.....	20	.....	23	286	.....	.....	72
.....	3,214	S.	D.	.....	.....	.....	.....	.....	.....	58	514	.....	.....	73
.....	627	B.	D.	F.	.....	8	.....	20	.....	556	383	.....	.....	74
.....	165	.....	D.	F.	.....	8	.....	150	.....	156	208	.....	.....	75
.....	588	B.	.....	G.	.....	8	.....	20	.....	(B) 318	318	.....	.....	76
.....	381	.....	D.	F.	.....	60	.....	20	.....	47	276	.....	.....	77
.....	228	.....	D.	P.	.....	8	.....	.....	258	106	238	.....	.....	78
.....	69	.....	D.	F.	.....	8	.....	20	.....	304	258	.....	.....	79
.....	129	.....	D.	F.	.....	8	.....	189	.....	66	210	.....	.....	80
.....	399	B.	D.	F.	.....	8	.....	50	.....	50	425	.....	.....	81
.....	540	B.	.....	F.	.....	8	.....	20	.....	18	292	.....	.....	82
.....	225	B.	.....	F.	.....	8	.....	20	.....	112	283	.....	.....	83
555	.....	B.	.....	F.	.....	8	.....	20	.....	109	310	.....	.....	84
.....	495	.....	D.	P.	.....	8	.....	20	.....	188	265	.....	.....	85
.....	180	.....	D.	P.	.....	8	.....	180	.....	35	280	.....	.....	87
.....	1,197	.....	.....	.....	.....	.....	.....	.....	.....	(C) 293	293	.....	.....	88
282	.....	B.	D.	F.	.....	8	.....	20	.....	83	444	\$2,377.67	.....	89
.....	285	.....	D.	F.	.....	8	.....	15	.....	16	263	2,214.24	.....	90
.....	1,515	.....	D.	F.	.....	8	.....	20	.....	100	396	.....	.....	91
.....	360	.....	D.	F.	.....	8	.....	.....	18	122	277	2,097.67	.....	92
.....	294	B.	.....	F.	.....	8	.....	159	.....	93	298	1,921.64	average	93
.....	1,614	B.	D.	F.	.....	250	36	.....	507	148	287	2,100.30	.....	94
.....	1,900	S.	D.	F.	.....	8	.....	20	.....	(B) 19	386	2,096.88	.....	95
1,350	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	363	2,209.35	\$2,155.06	99
.....	510	.....	.....	.....	.....	.....	.....	.....	.....	(B) 44	263	2,222.74	.....	100

No. Well	Date Drilled	Depth	Pump	Eng.	Well head	Drive pipe		Casing			Tubing		Pump tubing		
						8 in.	10 in.	8 3/4 in.	6 5/8 in.	6 1/4 in.	3 in.	4 in.	1 1/2 in.	2 in.	3/4 in.
		ft.				ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.
101	April, 1913	1,387	OWS	ECL	.....	.....	189	281	.....	863	1,401	.....	1,387	.....	.....
103	May, 1913	1,387	.....	.....	W.H.	.....	164	275	.....	825	1,393	.....	.....	.....	.....
104	July, 1913	1,393	OWS	OWS	.....	.....	165	180	.....	745	1,413	.....	1,393	.....	.....
105	June, 1913	1,425	.....	.....	W.H.	.....	165	318	.....	810	1,424	.....	.....	.....	.....
107	Oct., 1913	1,407	.....	.....	W.H.	.....	155	320	.....	795	1,403	.....	.....	.....	.....
108	July, 1913	1,385	OWS	OWS	.....	.....	148	315	.....	820	1,385	.....	1,385	.....	.....
110	Sept., 1913	1,397	.....	.....	W.H.	.....	162	335	.....	820	1,394	.....	.....	.....	.....
111	Nov., 1913	1,397	OWS	ECL	.....	.....	151	308	.....	880	1,397	.....	1,395	.....	.....
112	Oct., 1913	1,403	.....	.....	W.H.	.....	130	143	.....	810	1,410	.....	.....	.....	.....
113	Dec., 1913	1,393	OWS	OWS	.....	.....	154	165	.....	747	1,395	.....	1,393	.....	.....
114	Oct., 1913	1,370	OWS	OWS	.....	.....	148	166	.....	780	1,375	.....	1,370	.....	.....
115	Nov., 1913	1,389	OWS	ECL	.....	.....	153	170	.....	780	1,396	.....	1,389	.....	.....
116	Dec., 1913	1,375	OWS	ECL	.....	.....	137	260	.....	760	1,380	.....	1,375	.....	.....
118	Dec., 1913	1,373	.....	.....	W.H.	.....	152	167	.....	775	1,378	.....	.....	.....	.....
119	Jan., 1914	1,370	OWS	ECL	.....	.....	152	172	.....	775	.....	1,376	1,370	.....	.....
120	Jan., 1914	1,393	.....	.....	W.H.	.....	150	180	.....	760	1,399	.....	.....	.....	.....
121	Jan., 1914	1,345	OWS	OWS	.....	.....	140	155	.....	760	.....	1,350	1,345	.....	.....
123	.....	1,380	OWS	OWS	.....	.....	(Est.)	(Est.)	.....	760	1,382	.....	1,382	.....	.....
126	Mar., 1914	1,404	OWS	.....	.....	.....	140	155	.....	760	.....	.....	.....	.....	.....
127	Feb., 1914	1,372	OWS	ECL	.....	.....	190	270	.....	800	1,409	.....	.....	.....	.....
129	Mar., 1914	1,370	OWS	OWS	.....	.....	145	290	.....	830	.....	1,373	1,370	.....	.....
132	April, 1914	1,360	OWS	OWS	.....	.....	145	165	.....	753	1,371	.....	1,360	.....	.....
134	June, 1914	1,392	OWS	ECL	.....	.....	167	179	.....	855	1,392	.....	1,392	.....	.....
135	June, 1914	1,375	OWS	OWS	.....	.....	165	186	.....	771	.....	1,376	1,375	.....	.....
137	Sept., 1914	1,393	OWS	OWS	.....	.....	167	172	807	.....	1,400	.....	1,393	.....	.....
141	Oct., 1914	1,394	OWS	OWS	.....	.....	173	305	.....	837	1,396	.....	1,394	.....	.....
143	Oct., 1914	1,403	OWS	OWS	.....	.....	154	280	.....	825	1,406	.....	1,403	.....	.....
145	Dec., 1914	1,398	OWS	OWS	.....	.....	144	275	.....	812	1,402	.....	1,398	.....	.....
159	Sept., 1915	1,339	OWS	OWS	.....	.....	177	192	.....	800	.....	1,350	1,340	.....	.....
160	Jan., 1916	1,392	.....	.....	W.H.	.....	154	264	.....	810	.....	1,398	.....	.....	.....
162	May, 1916	1,395	.....	.....	W.H.	.....	158	200	.....	780	1,399	.....	.....	1,395-1 in.	.....
163	Jan., 1916	1,336	.....	.....	W.H.	.....	151	215	.....	780	1,340	.....	.....	.....	.....
164	Jan., 1916	1,374	OWS	OWS	.....	.....	155	190	.....	805	.....	1,378	1,374	.....	.....
166	Aug., 1916	1,375	.....	.....	W.H.	.....	157	205	.....	830	.....	1,380	.....	.....	.....
168	Sept., 1916	1,384	OWS	OWS	.....	.....	145	290	.....	815	.....	1,388	1,384	.....	.....
170	Nov., 1916	1,382	.....	.....	W.H.	.....	179	255	.....	785	.....	1,386	.....	.....	.....
172	June, 1917	1,397	.....	.....	W.H.	.....	151	287	.....	830	1,400	.....	.....	.....	.....
174	Dec., 1916	1,390	.....	.....	W.H.	.....	160	250	.....	820	1,395	.....	1,390-1 in.	.....	.....
175	Jan., 1917	1,330	OWS	OWS	.....	.....	175	200	.....	735	.....	1,335	1,330	.....	.....
176	Feb., 1917	1,346	.....	.....	W.H.	.....	152	188	790	.....	1,351	.....	.....	.....	.....
177	Jan., 1917	1,390	OWS	OWS	.....	.....	180	260	.....	785	1,396	.....	1,390	.....	.....
178	Jan., 1917	1,331	.....	.....	W.H.	.....	143	184	.....	787	1,336	.....	.....	.....	.....
180	Mar., 1917	1,362	Jack	.....	.....	.....	163	205	.....	715	.....	1,365	1,362	.....	.....
181	May, 1917	1,400	OWS	OWS	.....	.....	165	200	800	.....	1,405	.....	1,400	.....	.....
182	Mar., 1917	1,370	.....	.....	W.H.	.....	160	275	785	.....	.....	1,375	1,370	.....	.....
183	Mar., 1917	1,373	.....	.....	W.H.	.....	145	300	820	.....	1,377	.....	.....	.....	.....
184	May, 1917	1,406	.....	.....	W.H.	.....	135	287	820	.....	1,410	.....	.....	.....	.....
188	June, 1918	1,400	OWS	OWS	.....	.....	148	195	813	.....	1,402	.....	1,400	.....	.....
189	April, 1919	1,375	.....	.....	W.H.	.....	163	187	785	.....	1,376	.....	.....	.....	.....
190	June, 1919	1,405	.....	.....	W.H.	.....	151	241	799	.....	1,399	.....	.....	.....	.....
191	June, 1919	1,389	OWS	OWS	.....	.....	153	167	.....	785	1,400	.....	1,390	.....	.....
192	Jan., 1919	1,381	.....	.....	W.H.	.....	162	176	.....	754	1,409	.....	.....	.....	.....
193	July, 1919	1,385	.....	.....	W.H.	.....	154	173	.....	806	1,394	.....	.....	.....	.....
194	April, 1921	1,346	.....	.....	W.H.	.....	146	184	.....	817	1,358	.....	.....	.....	.....
195	Sept., 1921	1,393	OWS	OWS	.....	.....	152	194	779	.....	1,403	.....	1,395	.....	.....
196	June, 1921	1,341	OWS	OWS	.....	.....	145	193	814	.....	1,352	.....	1,342	.....	.....
197	July, 1921	1,343	.....	.....	W.H.	.....	148	193	811	.....	1,346	.....	.....	.....	.....
199	Sept., 1921	1,400	OWS	OWS	.....	.....	155	216	776	.....	1,408	.....	1,400	.....	.....
200	Oct., 1921	1,389	OWS	ECL	.....	.....	152	189	770	.....	1,396	.....	1,390	.....	.....
201	Dec., 1921	1,300	.....	.....	W.H.	.....	151	206	773	.....	1,403	.....	.....	.....	.....

PRODUCING WELLS—Continued.

Coll. lines		Surf. or bur.	Drip	Hut	Syphon	Tank	Water line			Open flow 1923	Rock pressure 1923	Cost	Average	No. Well
2 in.	3 in.						1 in.	1½ in.	2 in.					
ft.	ft.					bbl.	ft.	ft.		M cu. ft.				
.....	1,901	.....	.....	F.	.....	8	.....	15	.....	103	365	\$2,348.29		101
.....	654	B.	D.	.....	.....	8	.....	20	.....	416	388	2,340.23		103
.....	600	B.	D.	F.	.....	8	.....	20	.....	54	193	2,349.27		104
.....	1,008	S.	.....	.....	.....	.....	.....	.....	.....	125	434	2,456.34		105
1-1,400	645	.....	.....	.....	1 in. S.	.....	.....	.....	.....	37	433	2,362.37	1913	107
.....	1,100	.....	D.	F.	.....	.....	.....	80	.....	20	418	2,655.76		108
.....	378	.....	D.	.....	.....	.....	.....	.....	.....	66	458	2,411.85	average	110
.....	2,916	S.	.....	F.	.....	8	.....	20	.....	79	398	2,295.57		111
.....	468	.....	.....	.....	.....	8	.....	.....	.....	9	210	2,501.83		112
642	.....	B.	.....	F.	.....	8	.....	20	.....	41	348	2,451.79		113
.....	30	.....	D.	F.	.....	8	.....	204	.....	154	216	2,389.67	\$2,388.00	114
.....	25	.....	D.	.....	.....	8	.....	25	.....	20	221	2,386.01		115
.....	84	.....	D.	V.P.	.....	8	.....	20	.....	16	263	2,229.65		116
.....	489	.....	.....	.....	.....	8	.....	.....	.....	125	248	2,258.77		118
.....	882	.....	.....	F.	.....	8	.....	20	.....	109	214	2,241.91		119
1-1,393	762	.....	.....	.....	1 in. S.	.....	.....	.....	.....	41	227	2,372.37		120
.....	87	.....	D.	F.	.....	8	.....	40	.....	139	211	2,187.13		121
.....	165	S.	.....	F.	.....	8	.....	162	.....	20	213	.....		123
.....	429	B.	D.	P.	.....	8	.....	20	.....	79	310	2,412.14	1914	126
1-1,372	441	B.	D.	.....	1 in. S.	.....	.....	.....	.....	183	310	2,337.10		127
.....	111	.....	D.	P.	.....	8	.....	111	.....	63	258	2,352.40	average	129
.....	480	B.	D.	F.	.....	8	.....	20	.....	83	198	2,238.33		132
.....	261	B.	.....	F.	.....	8	.....	80	.....	50	322	2,283.64	\$2,310.00	134
.....	93	S.	B.H.	F.	.....	8	.....	93	.....	141	298	2,243.55		135
.....	56	.....	D.	G.	.....	8	.....	20	.....	66	287	2,274.95		137
.....	45	B.	D.	P.	.....	8	.....	20	.....	52	288	2,379.84		141
.....	1,863	.....	.....	F.	.....	8	.....	40	.....	57	400	2,374.09		143
.....	1,083	.....	.....	F.	.....	8	.....	1080	.....	40	318	2,325.10		145
.....	276	.....	D.	F.	.....	8	.....	20	.....	132	317	2,226.99		159
.....	1,742	.....	.....	.....	.....	.....	.....	.....	.....	114	255	3,213.29		160
.....	318	S.	D.	.....	1 in. S.	.....	.....	.....	.....	90	277	3,071.82		162
.....	90	.....	D.	.....	.....	8	.....	.....	.....	61	303	2,851.97	1916	163
.....	966	S.	D.	F.	.....	8	.....	20	.....	35	265	3,151.74		164
.....	80	.....	D.	.....	.....	8-8-40	.....	150	3736	1	272	3,152.09	average	166
.....	105	.....	P.	.....	.....	8	.....	40	.....	26	258	3,228.48		168
.....	50	.....	D.	.....	.....	.....	.....	.....	.....	(B) 61	250	3,285.24	\$3,289.00	170
.....	1,500	B.	.....	.....	.....	.....	.....	.....	.....	(B) 25	443	4,523.03		172
.....	1,714	.....	.....	.....	1 in. S.	.....	.....	40	.....	162	285	4,356.95		174
.....	564	.....	D.	F.	.....	8	.....	10	.....	489	257	.....		175
.....	1,250	.....	D.	.....	.....	.....	.....	.....	.....	169	283	.....		176
.....	840	.....	D.	F.	.....	8	.....	20	.....	58	270	5,387.75	1917	177
.....	111	S.	.....	.....	.....	.....	.....	.....	.....	117	300	4,300.00		178
.....	124	.....	.....	.....	.....	.....	.....	.....	.....	247	277	4,455.10	average	180
.....	102	S.	D.	F.	.....	8	.....	102	.....	41	248	4,572.58		181
.....	33	.....	.....	.....	1½ in. S.	.....	.....	33	.....	65	272	4,563.35	\$4,416.00	182
.....	1,750	.....	.....	.....	.....	.....	.....	.....	.....	(B) 14	266	3,965.65		183
.....	90	.....	D.	.....	.....	.....	.....	.....	.....	44	376	3,708.22		184
.....	1,065	S.	D.	F.	.....	8	.....	48	.....	9	383	.....		188
.....	60	.....	D.	.....	.....	.....	.....	.....	.....	243	262	4,977.60		189
.....	2,658	S.	.....	.....	.....	.....	.....	.....	.....	14	210	6,239.65	1919	190
.....	3,274	S.	.....	F.	.....	8	.....	.....	318	55	277	5,145.00	average	191
.....	1,300	.....	.....	.....	.....	.....	.....	.....	.....	(B)	222	5,765.25		192
.....	1,800	B.	B.H.	.....	.....	.....	.....	.....	.....	109	323	4,644.25	\$5,354.00	193
.....	80	.....	.....	.....	.....	.....	.....	.....	.....	141	210	5,419.14		194
.....	897	S.	D.	F.	.....	8	.....	105	.....	55	303	6,412.22		195
.....	591	S.	D.	P.	.....	8	.....	591	.....	127	193	6,290.59		196
.....	2,000	S.	D.	.....	.....	.....	.....	.....	.....	(B) 46	240	5,843.40		197
.....	1,950	S.	.....	P.	.....	8	.....	20	.....	67	303	6,461.80		199
.....	39	.....	D.	G.	.....	8	.....	39	.....	(B) 6	263	6,367.83		200
.....	1,146	S.	.....	.....	.....	.....	.....	.....	.....	(B) 6	331	6,431.10		201

TILBURY FIELD—

No. Well	Date Drilled	Depth	Pump	Eng.	Well head	Drive pipe		Casing			Tubing		Pump tubing		
						8 in.	10 in.	8 1/4 in.	6 3/4 in.	6 1/4 in.	3 in.	4 in.	1 1/2 in.	2 in.	3/4 in.
		ft.				ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.
202	Feb., 1922	1,330	OWS	OWS	.....	.....	143	173	809	.....	1,315	.....	1,315	.....	.....
203	Mar., 1908	1,420	.....	ECL	.....	179	.....	.....	5 3/8-760	.....	1,420	.....	1,420	.....	.....
204	Mar., 1909	1,378	.....	.....	W.H.	171	.....	.....	5 3/8-715	.....	1,381	.....	.....	.....	.....
205	Aug., 1911	1,390	OWS	OWS	.....	170	.....	.....	5 3/8-770	.....	1,396	.....	1,390	.....	.....
206	Mar., 1912	1,397	OWS	ECL	.....	185	.....	.....	.....	743	1,403	.....	1,400	.....	.....
207	Jan., 1913	1,385	OWS	ECL	.....	194	21	.....	.....	740	.....	1,389	1,385	.....	.....
208	Oct., 1914	1,371	OWS	ECL	.....	.....	172	.....	.....	735	1,374	.....	1,371	.....	.....
209	Aug., 1915	1,390	.....	.....	W.H.	.....	160	.....	.....	730	1,390	.....	.....	.....	.....
210	Nov., 1916	1,348	.....	.....	W.H.	.....	184	.....	.....	700	1,352	.....	.....	.....	.....
211	Aug., 1917	1,376	.....	.....	W.H.	.....	182	.....	.....	735	1,379	.....	.....	.....	.....
212	Sept., 1909	1,360	Jack	.....	.....	170	.....	.....	5 3/8-775	.....	1,355	.....	1,358	.....	.....
213	....., 1907	1,434	OWS	OWS	.....	200	.....	.....	5 3/8-765	.....	1,434	.....	1,430	.....	.....
214	May, 1914	1,405	OWS	ECL	.....	.....	174	.....	.....	741	1,405	.....	1,402	.....	.....
215	Dec., 1915	1,341	OWS	ECL	.....	.....	179	.....	.....	757	1,344	.....	1,340	.....	.....
216	Jan., 1917	1,338	.....	.....	W.H.	.....	176	200	.....	718	1,338	.....	.....	.....	.....
218	Sept., 1912	1,391	OWS	ECL	.....	.....	192	.....	.....	750	1,394	.....	.....	1,390-1 in.	.....
219	Aug., 1914	1,392	OWS	ECL	.....	.....	188	.....	.....	754	1,395	.....	1,390	.....	.....
220	Nov., 1915	1,375	OWS	OWS	.....	.....	180	.....	.....	745	1,383	.....	1,375	.....	.....
221	May, 1917	1,340	.....	.....	W.H.	.....	174	.....	735	.....	1,340	.....	.....	.....	.....
222	Sept., 1908	1,385	Jack	.....	.....	167	.....	.....	5 3/8-775	.....	1,387	.....	.....	1,385-1 in.	.....
223	Feb., 1909	1,341	OWS	ECL	.....	168	.....	.....	5 3/8-705	.....	1,341	.....	1,340	.....	.....
224	Sept., 1911	1,380	.....	.....	W.H.	.....	176	208	5 3/8-760	.....	1,380	.....	.....	.....	.....
225	Sept., 1915	1,390	OWS	OWS	.....	.....	170	.....	.....	730	1,394	.....	1,390	.....	.....
226	Mar., 1917	1,380	Jack	.....	.....	.....	165	.....	.....	720	1,380	.....	1,380	.....	.....
227	Mar., 1909	1,437	OWS	ECL	.....	.....	173	.....	5 3/8-760	.....	1,443	.....	1,437	.....	.....
228	May, 1909	1,360	OWS	OWS	.....	194	.....	.....	5 3/8-784	.....	1,365	.....	1,358	.....	.....
229	July, 1915	1,400	.....	.....	W.H.	.....	171	.....	.....	775	1,406	.....	.....	.....	.....
230	Sept., 1915	1,398	.....	.....	W.H.	.....	180	.....	.....	775	1,401	.....	.....	.....	.....
231	Nov., 1915	1,387	OWS	ECL	.....	.....	186	215	.....	760	1,389	.....	1,387	.....	.....
232	Oct., 1917	1,400	OWS	OWS	.....	.....	185	.....	.....	765	1,400	.....	1,400	.....	.....
233	Nov., 1913	1,413	OWS	ECL	.....	.....	184	.....	.....	777	1,413	.....	1,412	.....	.....
234	April, 1916	1,390	OWS	OWS	.....	.....	195	.....	.....	765	1,390	.....	1,390	.....	.....
235	June, 1916	1,328	OWS	OWS	.....	.....	167	.....	.....	750	1,328	.....	1,325	.....	.....
236	Aug., 1916	1,398	OWS	OWS	.....	.....	173	.....	.....	765	1,398	.....	1,395	.....	.....
237	May, 1908	1,430	Jack	.....	.....	183	.....	.....	5 3/8-755	.....	1,437	.....	1,430	.....	.....
238	May, 1912	1,404	OWS	ECL	.....	179	.....	.....	5 3/8-773	.....	1,410	.....	1,402	.....	.....
239	Mar., 1914	1,407	OWS	OWS	.....	.....	179	.....	.....	770	1,407	.....	1,407	.....	.....
240	Oct., 1916	1,378	Jack	.....	.....	.....	159	175	.....	710	1,381	.....	1,378	.....	.....
241	Dec., 1917	1,385	Jack	.....	.....	.....	.....	.....	.....	705	1,385	.....	1,385	.....	.....
242	Sept., 1913	1,413	OWS	ECL	.....	.....	186	.....	5 3/8-740	.....	1,419	.....	1,413	.....	.....
243	June, 1914	1,425	OWS	OWS	.....	.....	170	.....	.....	780	1,427	.....	1,425	.....	.....
244	July, 1922	1,410	.....	.....	W.H.	.....	164	254	796	.....	1,413	.....	.....	.....	.....
245	Jan., 1923	1,412	.....	.....	W.H.	.....	146	350	778	.....	1,415	.....	.....	.....	.....
246	April, 1923	1,350	.....	.....	W.H.	.....	165	209	743	.....	1,359	.....	.....	.....	.....
247	May, 1923	1,393	.....	.....	W.H.	.....	180	254	813	.....	1,396	.....	.....	.....	.....
Totals		221,555 ft.				8 in.—2,319 ft.	12 in.—155 ft. 10 in.—24,213 ft.	8 1/4 in.—26,723 ft.	6 3/4 in.—16,616 ft. 5 3/8 in.—11,479 ft.	6 1/4 in.—94,366 ft.	3 in.—168,212 ft.	4 in.—53,529 ft.	1 1/2 in.—139,717 ft.	2 in.—1,400 ft.	3/4 in.—1,305 ft. 1 in.—9,517 ft.

PRODUCING WELLS—Continued

Coll. lines		Surf. or bur.	Drip	Hut	Syphon	Tank	Water line			Open flow 1923	Rock pressure 1923	Cost	Average	No. Well
2 in.	3 in.						1 in.	1½ in.	2 in.					
ft.	ft.					bbl.	ft.	ft.	ft.	M cu. ft.				
117	978	S.		F.		8		69		29	433	\$6,195.43		202
	156			P.		8		20		75	263			203
	120	B.		N.		8		96		346	293			204
	612	D.		F.		8		20		59	208			205
										373	353			206
	678	B.	D.	F.		8		20		631	394			207
	291			V.P.		8		20		444	313			208
	153									654	262			209
	480	B.								922	357			210
	1,083									259	283			211
1,017		B.		F.		8		20		(A) 109	246			212
	1,464			F.		8-40		50		310	367			213
	1,044			F.		8			1110	172	242			214
	495	B.								67	318			215
										1,426	352			216
	738	S.		F.		8		20		44	257			218
	445			F.		8		20		479	310			219
	480	B.		F.		8		78		250	331			220
	330	B.								1,327	298			221
	20									(B) 22	238			222
4in.-162	372			F.		8		20		198	280			223
	471	B.								848	362			224
	435	B.		F.		8		30		528	370			225
	879	B.				8		20		444	277			226
	150	S.		F.				20		117	273			227
393		B.		F.		8		50		44	348			228
	930	B.	D.							266	280			229
	20									262	273			230
	420	B.		F.		8		42		67	343			231
	396	B.		F.		8	243			152	342			232
2½-453		B.		F.		8		90		58	327			233
	195			F.		8		195		(B) 10	285			234
	159	B.		F.		8		138		444	273			235
2½-189				F.		8		135		57	243			236
	40	S.								193	250			237
	594	S.		F.		8		20		203	307			238
	480	B.		F.		8	96			291	373			239
	204	S.						200		172	255			240
	675						20			286	250			241
	438	B.		F.		8	39		51	86	331			242
	501	S.&B.	D.	F.		8		93		79	465			243
	564									235	423	6,601.95		244
	60									48	515	4,319.01		245
	807									886	313	4,330.64		246
										250	290			247
2 in.—9,264 ft.						1-250 bbl.								
2½ in.—642 ft.						1-60 bbl.								
4 in.—162 ft.						2-40 bbl.								
						97-8 bbl.								
1½ in.—222 ft.						1 in.—449 ft.								
3 in.—4,165 ft.						1½ in.—7,604 ft.								
3 in.—93,370 ft.						2 in.—7,369 ft.								

F—Fair.
P—Poor.
G—Good.
V.P.—Very poor.
N.—New.

A—Well under repair.
B—Water in well.
C—Full of oil—no measurement.

ABANDONED WELLS—TILBURY FIELD

Well No.	Date drilled	Total depth	Date abandoned	Well No.	Date drilled	Total depth	Date abandoned
		ft.				ft.	
7	Sept. 1906	1,422	1919	109	Sept. 1913	1,384	1922
13	Mar. 1907	1,374	1920	117	Dec. 1913	1,385	1922
18	May 1907	1,474	1922	122	Feb. 1914	1,390	1920
21	Aug. 1907	1,445	1919	128	April 1914	1,345	1922
25	Mar. 1908	1,438	1919	130	April 1914	1,395	1919
26	May 1908	1,420	1919	131	April 1914	1,382	1923
33	Feb. 1909	1,380	1919	133	May 1914	1,382	1920
34	Jan. 1909	1,455	1919	136	July 1914	1,400	1920
36	May 1909	1,465	1919	138	Aug. 1914	1,400	1920
40	Sept. 1909	1,390	1917	139	Aug. 1914	1,405	1922
42	Oct. 1909	1,414	1920	140	Oct. 1914	1,388	1921
44	Nov. 1909	1,440	1919	142	1914	.....	1918
49	Feb. 1911	1,400	1922	144	Nov. 1914	1,386	1921
54	April 1911	1,326	1920	158	April 1915	1,398	1920
55	May 1911	1,407	1919	161	Dec. 1915	1,378	1921
57	July 1911	1,390	1922	165	Sept. 1916	1,386	1922
63	May 1907	1,420	1921	167	Jan. 1918	1,370	1921
71	July 1911	1,387	1920	169	Oct. 1916	1,386	1922
86	Mar. 1910	.....	1920	171	Nov. 1916	1,377	1922
97	Oct. 1912	1,460	1919	173	Nov. 1916	1,370	1918
98	Aug. 1912	.....	1921	179	July 1917	1,362	1920
102	April 1913	1,391	1920	217	July 1908	1,403	1922
106	July 1913	1,408	1922				

45 wells averaging 1,420 feet deep, at a mean cost of \$1.75 per foot, equals \$111,825.

FITTINGS FOR TYPICAL WELL HEAD—TILBURY FIELD

With 4 in. tubing.

1	4 in. x 3 in. heavy cast tee.....	\$4.45
1	4 in. x 3 in. swedge nipple.....	1.57
1	3 in. x 1 in. stuffing box.....	4.00
2	3 in. nipples, at 43 cents.....	.86
1	3 in. saddle.....	1.50
2	3 in. gate valves, at \$22.60.....	45.20
1	3 in. heavy cast tee.....	4.45
1	3 in. heavy cast flange union.....	1.82
1	3 in. x 1 in. bushing.....	.23
2	1 in. stop cocks, at \$1.03.....	2.06
	Labour, team and miscellaneous.....	10.00

Total..... \$76.14

FITTINGS FOR TYPICAL PUMP WELL—TILBURY FIELD

With 4 in. tubing—1½ in. pump tubing.

1	4 in. x 3 in. heavy cast tee.....	\$4.45
1	4 in. x 1½ in. stuffing box.....	3.00
3	3 in. nipples, at 43 cents.....	1.29
1	3 in. gate valve.....	22.60
1	3 in. tee.....	4.45
1	3 in. heavy cast flange union.....	1.82
1	3 in. saddle.....	1.50
1	3 in. plug.....	.20
1	O.W.S. pump and power and 1 O.W.S. or Eclipse engine and magneto with foundation and connections.....	950.00
	4 ft. of 4 in. reservoir and fittings.....	5.64
	Labour, team and miscellaneous, apart from pump, etc.....	7.00

Total..... \$1,001.95

DOVER FIELD—WELLS AND EQUIPMENT

We have collected the data with regard to wells and equipment in Dover field, and the following is a summary of the same. The inventory follows later. Where the data were not available we have inserted our estimates.

SUMMARY OF DETAILS OF REPRODUCTION COST—DOVER FIELD WELLS

Item	Quantity	Unit cost	Reproduction cost new
Drilling.....	23,065 ft.	\$3.50	\$80,727.50
Rigs and sheds.....	7	1,800.00	12,600.00
13 in. drive pipe.....	79 ft.	3.75	296.25
12½ in. do.....	445 ft.	3.34	1,486.30
10 in. do.....	1,882 ft.	2.20	4,138.20
8¼ in. casing.....	2,259 ft.	1.85	4,179.15
6½ in. do.....	18,607 ft.	1.30	24,189.10
5½ in. do.....	6,243 ft.	.87	5,431.41
4 in. tubing.....	3,406 ft.	.67½	2,299.05
3 in. do.....	9,606 ft.	.52½	5,043.15
Fittings at well head and pumping outfits.....	4	704.02	2,816.08
Inserting and connecting pipe.....	5	200.00	1,000.00
Pumping tubing.....	16,200 ft.	.53	8,586.00
100 bbl. tank.....	1	90.00	90.00
40 bbl. tanks.....	2	50.00	100.00
Anchor packers.....	7	45.00	315.00
No. 7 California separator.....			2,206.14
No. 13 do.....			1,643.30
No. 16 do.....			1,872.18
No. 1 separator tank, etc.....			445.95
Boiler house for pumping oil.....			1,520.57
Field boiler house.....			1,696.78
Fittings at oil tanks.....			3,235.01
2 in. water line.....			1,526.45
2 in. steam lines.....			390.60
2 in. fuel lines.....			318.37
Fuel line regulator.....	1		90.31
Oil lines.....			3,295.20
Oil tanks, 250 bbl.....	3	200.00	600.00
Pumps and pump powers as per page 61.....			8,487.48
Allowance for dry wells as per page 54.....			\$180,607.53
			70,000.00
Total.....			\$250,607.53

Actual Cost—Dover Wells

According to the company's books, the actual cost of the producing wells Nos. 7, 11, 12, 13, 14 and 16 was \$133,709. This amount includes drilling, casing, tubing, etc. These wells range from 3,000 to 3,774 feet in depth.

Applying the same method as in the other cases we have:—

Year	Cost	Index number	Multiple
1917 (estimated).....	\$12,000	239	2,868,000
1918 (actual).....	14,836	279	4,139,244
1919 do	89,373	245	21,896,385
1922 do	17,500	162	2,835,000
Totals.....	\$133,709		31,738,629

$$\text{Average index number} = \frac{31,738,629}{133,709} = 237.4$$

This average index number shows that the actual cost was greater than our appraisal value, as the index number for July 31, 1923, was 192.5 compared with the above average of 237.41. We estimate that these wells cost about \$16,000 more than the reproduction cost new, owing to the higher prices of material and labour in the above years.

Applying the same factors to the total reproduction cost new of Dover field equipment of \$180,320.78, we estimate the original cost, apart from allowing for dry wells, at:

$$\$180,607.53 \times \frac{237.4}{192.5} = \$222,730.00$$

This is on the assumption that all equipment was new when installed.

Depreciation—Dover Wells

The amount required to restore the Dover wells and equipment to normal operating efficiency is negligible as the plant is comparatively new, the oldest operating well being only 6 years old.

With reference to the physical depreciation, we consider that it would be about ten per cent., or \$18,060, on the basis of new equipment.

The accrued retirement reserve, less a residual value of 30 per cent. of the reproduction cost new of equipment, will be in proportion to the estimated life of Dover gas field which is about 16 years, of which four have elapsed. On the straight line basis this would amount to \$55,156; and on the five per cent. sinking fund basis it would be about \$37,306.

Dover Abandoned and Dry Wells

The observations made by us in connection with the Tilbury wells which were abandoned will apply in this case.

Similarly the observation with regard to dry wells applies, and we consider it reasonable to allow \$50,000 for these. Hazards have to be taken in connection with this business, otherwise the supply will be depleted to the disadvantage of all concerned.

DOVER FIELDS—PRODUCING WELLS

No.	Date	Depth	Height of rig	Power	Pump- ing outfit	Drive pipe	Casing				Tubing		Tank bbl.	Cost
							10 in.	8½ in.	6 in.	5½ in.	4 in.	3 in.		
1	May, 1917.....	ft.	ft.		in.	13 in.—79 ft.	ft.	ft.	ft.	ft.	ft.	ft.		(Est.) \$ 12,000.00
7	May, 1918.....	3,185	72	Steam	2	12½ in.—70 ft.	301	1,169	2,065			3,190		(Act.) 14,836.83
11	Jan., 1919.....	3,277	56	Hercules	2	12½ in.—72 ft.	232	1,090	2,108	3,313		3,277	1-40	22,479.78
12	Oct., 1919.....	3,285	72	Steam	2	12½ in.—75 ft.	257		2,930					29,346.09
13	May, 1919.....	3,358	56		2	12½ in.—80 ft.	281		2,689	2,930				19,314.09
14	May, 1919.....	3,000	56			12½ in.—67 ft.	255		2,929		86	2,939		18,231.20
16	April, 1922.....	3,186	56	Steam	2	12½ in.—81 ft.	262		2,911		3,320		1-100	17,500.14
		3,774	56				294		2,975				1-40	
	Totals.....	23,065				13 in.—79 12½ in.—445	1,882	2,259	18,607	6,243	3,406	9,606	2-40 1-100	\$ 133,708.13

DRY WELLS—DOVER FIELD

No.	Date	Depth	Drive pipe		Casing				Cost
			12½ in.	10 in.	8½ in.	6⅝ in.	5⅜ in.	6¼ in.	
		ft.	ft.	ft.	ft.	ft.	ft.	ft.	
2	Jan., 1918.....	3,765	.....	.....	.....	.....	.....	.....	\$6,890.08
3	Jan., 1918.....	3,304	.....	.....	.....	.....	.....	.....	7,236.01
4	Jan., 1918.....	3,265	.....	.....	.....	.....	.....	.....	5,840.65
5	Jan., 1918.....	1,700	.....	.....	85	.....	.....	.....	.....
6	Jan., 1918.....	3,735	.....	.....	.....	.....	.....	.....	.....
9	Aug., 1918.....	3,330	.....	.....	.....	150	.....	.....	10,855.52
15	June., 1922.....	3,540	84	104	.....	.....	.....	.....	17,259.00
17	Nov., 1922.....	3,355	.....	.....	.....	22	.....	.....	10,886.53
	July, 1923.....	3,720	.....	.....	.....	.....	.....	.....	.....
	Totals.....	29,714	84	104	85	172	.....	.....	.....

The cost of wells Nos. 2, 3, 4, 9, 15, and 17 was \$58,968 and averaged \$2.42 per foot. Applying this figure to 29,714 feet, we have about \$72,000 as the approximate cost of dry wells in Dover field. We have allowed \$70,000.

ABANDONED WELLS—DOVER FIELD

No.	Date	Depth	Drive pipe		Casing				Cost	Abandoned
			12½ in.	10 in.	8½ in.	6⅝ in.	5⅜ in.	6¼ in.		
		ft.	ft.	ft.	ft.	ft.	ft.	ft.		
8	Oct., 1918.....	3,560	.....	.....	.....	450	192	.....	\$12,532.81	Nov. 1919
10	Jan., 1919.....	3,315	.....	.....	.....	600	.....	.....	22,192.80	Aug. 1920
	Totals.....	8,575	.....	.....	.....	1,050	192	.....	\$34,725.61	.....

FITTINGS, TYPICAL WELL HEAD—DOVER FIELD

ABOVE FLOOR

Oil well wire line pump.....	\$108.75
Pumping adjustment, complete.....	16.95
Upper oil saver stuffing box, complete.....	7.77
Lower do do.....	4.20
One ⅝ in. wire pumping line, 3,500 ft. at \$8.90 per 100 ft.....	311.50

TYPICAL WELL HEAD No. 14 DOVER

1 4 in. tee.....	4.45
1 4 in. x 3 in. swedge nipple.....	1.57
1 3 in. gate valve, extra heavy.....	27.59
1 4 in. x 2 in. pumping tubing bushing.....	.39
1 2 in. tee—heavy cast.....	.73
1 2 in. high pressure gate valve.....	18.42
2 2 in. nipples, at 16 cents.....	.32

BELOW FLOOR

1 2 in. x 10 ft. steel seamless working barrel.....	13.70
1 2 in. standing valve.....	2.40
1 2 in. Bramo working barrel, complete.....	34.59
1 Rope socket with swivel.....	17.22
1 Set pumping jars.....	10.57
1 Iron valve rod, 1 in. x 7 ft. with joints.....	12.70
5 Iron sinker rods, 1⅝ in. x 15½ ft. with joints.....	35.20
Labour, team and miscellaneous.....	75.00

Total..... \$704.02

No. 7 CALIFORNIA SEPARATOR—DOVER FIELD

Quantity	Item	Unit cost	Reproduction cost new
140 ft.	13 in. pipe.....	\$3.75	\$525.00
140 ft.	10 in. do	2.20	308.00
140 ft.	3 in. do .....	.44	49.60
1	2 in. high pressure O.W.S. gate valve.....		18.42
1	3 in. high pressure Darling valve, extra heavy		27.80
2	3 in. No. 8 Ludlow valve.....	27.59	55.18
1	3 in. high pressure valve.....		22.60
1	3 in. heavy cast tee.....		2.43
1	3 in. heavy cast ell.....		1.53
1	3 in. heavy cast Y.....		2.25
1	3 in. welded Y.....		3.25
4	3 in. heavy cast flange unions.....	1.82	7.28
4	3 in. nipples.....	.43	1.72
1	10 in. bull plug.....		10.00
1	8 in. x 3 in. swedge nipple.....		7.27
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. nipple.....		.16
1	2 in. x 1 in. reducer.....		.25
1	1 in. nipple.....		.07
1	1 in. brass stop cock.....		1.03
56	1 in. Penberthy globe valves.....	2.91	162.96
84	1 in. nipples.....	.07	5.88
56	1 in. dart unions.....	.58	32.48
28	11 ft. lengths 1 in. pipe.....	.10	30.80
56	1 in. welds.....	1.00	56.00
103 ft.	3 in. pipe.....	.44	45.32
3	8 in. automatics complete.....	35.00	105.00
1	10 in. bull plug.....		10.00
1	8 in. x 3 in. swedge nipple.....		7.27
1	3 in. high pressure Darling valve.....		22.60
1	3 in. x 2 in. swedge nipple.....		1.18
2	2 in. plugs.....	.08	.16
1	3 in. plug.....		.20
1	3 in. heavy cast ell.....		1.53
1	3 in. heavy cast flange union.....		1.82
2	3 in. nipples.....	.43	.86
1	2 in. heavy cast ell.....		.58
1	2 in. malleable ell.....		.33
3	2 in. nipples.....	.16	.48
1	2 in. x 1 in. bushing.....		.11
1	2 in. x 1¼ in. malleable reducer.....		.25
2	1¼ in. nipples.....	.09	.18
1	1¼ in. x 1 in. malleable reducer.....		.10
1	1¼ in. Penberthy valve.....		3.50
3	1 in. Penberthy valves.....	2.91	8.73
6	1 in. brass stop cocks.....	1.03	6.18
15	1 in. ells.....	.16	2.40
4	1 in. dart unions.....	.58	2.32
5	1 in. lip unions.....	.23	1.15
14	1 in. malleable street ells.....	.19	2.66
4	1 in. malleable tees.....	.22	.88
3	2 in. x 1 in. malleable tees.....	.44	1.32
31	1 in. nipples.....	.07	2.17
70 ft.	1 in. pipe.....	.10	7.00
180 ft.	2 in. pipe.....	.24	43.20

No. 7 CALIFORNIA SEPARATOR—DOVER FIELD—Continued.

Quantity	Item	Unit cost	Reproduction cost, new
1	2 in. flange union.....		\$1.22
1	2 in. plug.....		.20
2	200 bbl. tanks.....	\$150.00	300.00
1	40 bbl. tank.....		50.00
	Labour, team and miscellaneous.....		242.10
	Total.....		\$2,206.14

No. 13 CALIFORNIA SEPARATOR—DOVER FIELD

Quantity	Item	Unit cost	Reproduction cost new
190 ft.	12½ in. drive pipe.....	3.35	636 50
190 ft.	10 in. screw.....	2.20	418.00
190 ft.	4 in. screw.....	.62	117.80
8	Welds on 12½ in. Lengths 3 in. pipe, 10 ft. long, one end welded to 4 in. and one to 12½ in., with 4 welds on each loop. 10 ft. pipe at 44 cents, plus 6 welds at \$1.00.....	5.00	40.00
6		10.40	62.40
1	Welded bevel end to 12½ in. with 3 in. nipple and plug.....		3.43
1	10 in. bull plug.....		10.00
1	4 in. nipple welded to 10 in.....		3.00
3	2 in. nipples welded.....	1.16	3.48
1	4 in. heavy cast ell.....		2.68
1	4 in. x 3 in. swedge nipple.....		1.57
7	3 in. heavy cast flange unions.....	1.82	12.74
1	2 in. plug.....		.08
2	2 in. malleable tees.....	.44	.88
2	2 in. nipples.....	.16	.32
2	2 in. x 1 in. malleabl reducers.....	.25	.50
1	2 in. x 1 in. bushing.....		.11
2	1 in. Crane valves.....	1.03	2.06
1	1 in. Penberthy valve.....		2.91
1	1 in. dart union.....		.58
5	1 in. malleable tees.....	.22	1.10
5	1 in. malleable street ells.....	.16	.80
1	8 in. automatic complete.....	35.00	35.00
24 ft.	1 in. pipe.....	.10	2.40
1	Welded end to 10 in.....		3.00
1	Welded end to 12½ in.....		4.00
2	4 in. nipples welded to 10 in. and 12½ in.....	3.00	6.00
1	4 in. heavy cast flange union.....		2.55
1	Swedge with 2 in. plug.....		1.88
2	3 in. plugs.....	.20	.40
1	3 in. cap.....		.43
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. plug.....		.08
1	3 in. heavy cast flange union.....		1.82
1	3 in. high pressure Jericka valve.....		22.60
4	3 in. nipples welded to 3 in. pipe.....	1.43	5.72
16 ft.	3 in. pipe.....	.44	7.04
18 ft.	4 in. pipe.....	.62	11.16
	Labour, team and miscellaneous.....		217.00
	Total.....		\$1,643.30

No. 16 CALIFORNIA SEPARATOR—DOVER FIELD

Quantity	Item	Unit cost	Reproduction cost new
112 ft.	18 in. pipe.....	\$3.70	\$414.40
112 ft.	10 in. pipe.....	2.20	246.40
112 ft.	4 in. pipe.....	.62	69.44
5	10 in. welded joints.....	5.00	25.00
2	10 in. welded caps with one 2 in. welded nipple, and one 3 in. welded nipple; caps at \$5.00 each, welds at \$2.00 each.....		12.59
5	18 in. welded joints.....	6.00	30.00
2	18 in. welded caps, one with 4 in. welded nipple.....	10.00	20.00
2	3 in. welded nipples.....	1.43	2.86
6	Lengths 2 in. pipe, 15 ft. long, welded at each end to 4 in. and 18 in. 15 ft. at 24 cents, plus two welds at \$1.00.....	5.60	33.60
1	4 in. x 3 in. heavy cast tee.....		4.45
2	4 in. heavy cast tees.....	4.45	8.90
2	4 in. plugs.....	.34	.68
1	4 in. flange union, cast.....		2.55
3	4 in. nipples.....	.72	2.16
1	4 in. x 3 in. swedge nipple.....		1.57
2	3 in. high pressure Ludlow No. 8 valves.....	27.59	55.18
2	3 in. nipples.....	.43	.86
2	3 in. heavy cast flange unions.....	1.82	3.64
1	3 in. heavy cast tee.....		2.43
2	3 in. malleable tees.....	1.10	2.20
2	3 in. plugs.....	.20	.40
1	4 in. x 2 in. swedge nipple.....		1.88
1	4 in. x 3 in. swedge nipple.....		1.57
3	3 in. x 2 in. swedge nipples.....	1.18	3.54
2	2 in. high pressure gate valves.....	14.00	28.00
4	2 in. street elbows.....	.37	1.48
5	2 in. tees.....	.44	2.20
5	2 in. malleable elbows.....	.33	1.65
1	2 in. flange union.....		1.22
1	2 in. x 1 in. malleable reducer.....		.25
1	2 in. x 1 in. bushing.....		.11
2	1 in. Crane globe valves.....	2.91	5.82
4	1 in. brass stop cocks.....	1.03	4.12
5	2 in. plugs.....	.08	.40
14	1 in. nipples.....	.07	.98
7	1 in. street elbows.....	.19	1.33
7	1 in. malleable elbows.....	.16	1.12
5	1 in. dart unions.....	.58	2.90
220 ft.	2 in. pipe, over to oil line.....	.24	52.80
65 ft.	1 in. pipe.....	.10	6.50
1	Steam pump, direct double acting, 2½ in. x 7½ in. x 10 in.....		400.00
1	10 in. automatic trip float.....		45.00
1	250 bbl. tank.....		200.00
	Labour, team and miscellaneous.....		170.00
	Total.....		\$1,872.18

FITTINGS OF SEPARATOR TANK AT No. 1—DOVER FIELD

Quantity	Item	Unit cost	Reproduction cost new
	4 ft. x 10 ft. tank double rivetted.....		\$300.00
1	8 in. x 4 in. swedge nipple.....		6.37
1	8 in. x 3 in. swedge nipple.....		7.27
1	4 in. heavy cast ell.....		2.68
1	4 in. x 3 in. swedge nipple.....		1.57
3	3 in. heavy cast ells.....	\$1.50	4.50
2	3 in. heavy cast flange unions.....	1.82	3.64
4	3 in. nipples.....	.43	1.72
1	4 in. x 2 in. swedge nipple.....		1.88
1	2 in. x 1 in. malleable reducer.....		.25
3	1 in. brass stop cocks.....	1.03	3.09
1	8 in. automatic complete.....		35.00
3	1 in. lip unions.....	.23	.69
4	1 in. ells.....	.16	.64
10	1 in. nipples.....	.07	.70
29 ft.	1 in. pipe.....	.10	2.90
1	3 in. high pressure O.W.S. gate valve.....		27.59
1	3 in. high pressure Darling gate valve.....		22.60
1	3 in. heavy cast Y.....		2.00
2	3 in. nipples.....	.43	.86
	Labour, team and miscellaneous.....		20.00
	Total.....		\$445.95

BOILER HOUSE FOR PUMPING OIL—DOVER FIELD

Quantity	Item	Unit cost	Reproduction cost new
1	O.W.S. boiler, 25 H.P., complete.....		\$1,250.00
2	2 in. malleable tees.....	\$0.44	.88
1	2 in. street elbow.....		.37
1	2 in. brass stop cock.....		2.24
4	2 in. nipples.....	.16	.64
1	2 in. light cast flange union.....		.81
2	2 in. x 1 in. cast bushings.....	.11	.22
6	1 in. Penberthy valves, brass.....	2.91	17.46
2	1 in. brass stop cocks.....	1.03	2.06
13	1 in. nipples.....	.07	.91
7	1 in. malleable tees.....	.22	1.54
5	1 in. malleable street elbows.....	.19	.95
1	1 in. lip union.....		.23
1	1 in. Penberthy check valve.....		2.86
1	1 in. Penberthy injector, brass.....		24.40
	Building, frame, corrugated iron roof, 16 ft. x 20 ft. x 12 ft. 6 in.		180.00
	Labour, team and miscellaneous.....		35.00
	Total.....		\$1,520.57

FIELD BOILER HOUSE—DOVER FIELD

Quantity	Item	Unit cost	Reproduction cost new
1	N.S. Co., 30 H.P. "Special" boiler.....		\$1,350.00
3	2 in. globe valves.....	\$4.43	13.29
3	2 in. flange unions.....	1.22	3.66
2	2 in. brass stop cocks.....	2.24	4.48
5	2 in. tees.....	.44	2.20
5	2 in. plugs.....	.08	.40
6	2 in. street elbows.....	.37	2.22
4	2 in. nipples.....	.16	.64
3	1 in. brass stop cocks.....	1.03	3.09
5	1 in. globe valves.....	1.68	8.40
1	1 in. Penberthy injector.....		24.40
1	1 in. steam regulator.....		25.00
40 ft.	1 in. pipe.....	.10	4.00
1	40 bbl. tank.....		50.00
	Building, 12 ft. x 20 ft. x 12 ft., frame.....		150.00
	Labour, team and miscellaneous.....		55.00
	Total.....		\$1,696.78

FITTINGS, ETC., AT OIL TANKS—DOVER FIELD

Quantity	Item	Unit cost	Reproduction cost new
1,440 ft.	2 in. pipe.....	\$0.44	\$633.60
12	light cast stop cocks, 2 in.	3.14	37.68
37	2 in. malleable tees.....	.44	16.28
22	2 in. plugs.....	.08	1.76
7	2 in. light cast flange unions.....	.81	5.67
10	2 in. malleable ells.....	.33	3.30
42	2 in. nipples.....	.16	6.72
8	250 bbl. tanks.....	200.00	1,600.00
1	150 bbl. tanks.....		100.00
2	100 bbl. tanks.....	90.00	180.00
2	40 bbl. tanks.....	50.00	100.00
1	Duplex double acting pump, 6 in. x 12 in. and 4 in. x 12 in.		400.00
	Labour, team and miscellaneous.....		150.00
	Total.....		\$3,235.01

WATER LINE—DOVER FIELD

- (1) Pumphouse to No. 1, 2 in., 1,045 ft.
 (2) do (2) to No. 11, 2 in., 1,350 ft.
 (3) Junction on (2) to No. 13, 2 in., 1,400 ft.

Total.....	3,795 ft. at 31 cents.....	\$1,176.45
Water tanks, 1—250 bbl.....		150.00
1—200 bbl.....		200.00
Total.....		\$1,526.45

STEAM LINE—DOVER FIELD

- Boilerhouse to No. 1, 2 in., 820 ft.
 do to No. 14, 2 in., 440 ft.

Total.....	1,260 ft. at 31 cents.....	\$390.60
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FUEL LINE—DOVER FIELD

2 in.,	207 ft.	
2 in.,	820 ft.	
Total	1,027 ft. at 31 cents.....	\$318.37

FUEL LINE REGULATOR—DOVER FIELD

1 2 in. Chaplin-Fulton regulator.....	\$71.80
1 2 in. lip union.....	.23
2 2 in. nipples at 16 cents .....	.32
54 ft. of 2 in. pipe, at 24 cents.....	12.96
Labour, team and miscellaneous.....	5.00
Total.....	\$90.31

OIL LINES—DOVER FIELD

3 INCH LINE

3 in. from No. 14 to tanks at No. 7.....	477 ft.
From pump to tank at No. 7, including lead lines.....	1,500 ft.
From pump to tanks near orifice meter.....	3,590 ft.
Total.....	5,567 ft. at 54 cents.....
	\$3,006.18

2 INCH LINE

2 in. to No. 7.....	160 ft.
To No. 1.....	250 ft.
No. 12 to No. 7 drip.....	532 ft.
Total.....	942 ft. at 31 cents.....
	\$289.02

OIL TANKS AT NO. 11

3 250 bbl. at \$200	\$600.00
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DOVER FIELD—PUMPS AND PUMP POWERS

PUMPHOUSE

8 ft. x 12 ft. x 8 ft. frame building.....	\$66.88
1 4 H.P., 475 R.P.M., Nova engine direct connected engine and pump (pump, U type, 2 in.).....	460.00

No. 2 PUMPHOUSE

8 ft. x 27 ft. x 8 ft., frame building.....	\$116.40
1 Hoag oil engine, 6 H.P.....	400.00
1 Pump 4 in. x 24 in., Oil Well Supply.....	100.00
1 O.W.S. gear power.....	100.00
4 2 in. cast stop cocks, at \$3.35	13.40
2 2 in. flange unions, at \$1.22.....	2.44
8 2 in. malleable tees, at 44 cents	3.52
14 2 in. nipples, at 16 cents	2.24

No. 7 WELL

1 Hercules motor, 5 in. x 6 in.....	\$850.00
1 Small grinder.....	50.00
1 Oil City reversible clutch.....	575.00
1 Chalmers transmission.....	250.00
1 Page pump.....	45.00
1 Steel frame, Can DesMoines steel.....	70.00
1 Hele Shaw clutch.....	140.00
1 12 in. belt, Lapwing.....	100.00
1 Motor shed, 15 ft. x 24 ft. x 8 ft., wood frame.....	192.60

SPARE

1 Steel frame.....	\$70.00
1 Oil City clutch.....	575.00
1 Chalmers transmission.....	250.00
1 Page pump, 1 in.....	45.00
1 6 cyl. Mitchell motor.....	600.00
1 Hele Shaw clutch, 24 in.....	140.00

No. 14

1 10 in. x 12 in., O.W.S. steam engine.....	850.00
1 12 in. belt, Leviathan.....	150.00
1 Engine shed, 15 ft. x 15 ft. x 8 ft., frame.....	90.00

No. 11

1 12 in. x 12 in., Ajax Iron Works, engine.....	850.00
1 12 in. Lapwing belt.....	150.00
1 Engine shed, 15 ft. x 15 ft. x 8 ft., frame.....	90.00

No. 1

1 25 H.P. Warren steam engine.....	850.00
1 Engine house, 15 ft. x 15 ft., frame.....	90.00
1 12 in. belt.....	150.00

Total..... \$8,487.48

DAWN FIELD WELLS AND EQUIPMENT

We have collected the data with regard to wells and equipment in Dawn field, and the following is a summary of the same. The inventory follows on page 62. Where the data were not available we have inserted our estimates.

SUMMARY OF THE REPRODUCTION COST OF DAWN FIELD WELLS

Item	Quantity	Unit cost	Reproduction cost new
Drilling.....	9,487 ft.	\$3.00	\$28,461.00
Engine, pump and fittings.....	1		1,001.95
Hut.....	1		39.00
Well heads as per inventory.....			708.42
12½ in. drive pipe.....	91 ft.	3.34	303.94
10 in. do.....	780 ft.	2.20	1,716.00
8¼ in. casing.....	2,687 ft.	1.85	4,970.95
6⅝ in. do.....	2,342 ft.	1.30	3,044.60
6¼ in. do.....	1,160 ft.	.95	1,102.00
3 in. tubing.....	9,490 ft.	.52¼	4,982.25
1 in. pump tubing.....	1,829 ft.	.36	655.20
Inserting and connecting pipes.....	5	60.00	300.00
Drips.....	4	90.00	360.00
Tanks, 8 bbl.....	1		15.00
1½ in. water line.....	20 ft.	.20	4.00
Anchor packers.....	5	45.00	225.00
			\$47,889.31
Allowance for dry wells.....			\$50,000.00
Total.....			\$97,889.31

Actual Cost Dawn Wells

The Gas Company's books show that the Dawn field producing wells cost as below. Applying similar methods as in other wells, we have:—

Year	Well	Ledger cost	Index No.	Multiple
1914.....	No. 1	\$3,161	100	316,100
1921.....	No. 3	17,985	217	3,902,745
1922.....	No. 4	6,879	162	1,114,398
1922.....	No. 6	6,208	162	1,005,696
1922.....	No. 7	6,624	162	1,073,088
Total.....		\$40,857	.....	7,412,027

$$\text{Average index number} = \frac{7,412,027}{40,857} = 183.5.$$

Applying this factor to \$47,889.31 we get:

$$\$47,889.31 \times \frac{183.5}{192.5} = \$45,700.00 \text{ as the probable original cost.}$$

Depreciation Dawn Wells

The sum necessary to restore the Dawn wells and equipment to normal operating efficiency is small, as the equipment is relatively new.

With regard to physical depreciation we would consider that 10 per cent. would be sufficient, or \$4,789.

The accrued retirement reserve, less the residual value of 30 per cent. of the reproduction cost of the equipment would be based upon the average life of the Dawn gas field, which is fifteen years, of which three have elapsed. This on the straight line basis would amount to about \$18,412, and on a five per cent. sinking fund it would amount to about \$12,798.

DAWN FIELD—PRODUCING WELLS

No.	Date	Depth	Pump	Eng.	Hut	Well head	Drive pipe		Casing				Tubing	
							12 ½ in.	10 in.	8 ¼ in.	6 ½ in.	5 ¾ in.	6 ¼ in.	3 in.	4 in.
1	Aug., 1914	ft.				W.H.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.
3	Nov., 1921	1,594				W.H.	91	495	390			1,160	1,596	.....
4	May., 1922	1,820	OWS	OWS	F.	W.H.		89	1,160				1,811	.....
6	Aug., 1922	1,678				W.H.		89	468	1,173			1,666	.....
7	Oct., 1922	2,195				W.H.		65	1,174				2,195	.....
		2,200				W.H.		71	495	1,169			2,222	.....
	Totals...	9,487					91	780	2,687	2,342	.....	1,160	9,490	.....

DAWN FIELD—PRODUCING WELLS—Continued.

No.	Pump tubing			Sur. or bur.	Collecting lines		Drip	Tank	Water line			Rock press	Open flow	Cost
	1 ½ in.	2 in.	¾ in.		2 in.	3 in.			1 in.	1 ½ in.	2 in.			
1	ft.	ft.	ft.	S.		miles	D.	bbl.		ft.				\$3,161.04
3				S.		0.425	D.	8		20				17,985.01
4	*1,820			S.		0.38	D.							6,879.09
6				S.		1.27	D.							6,208.42
7				S.		0.39	D.							6,623.98
						0.80								
						3.265				20				.....

*Estimated.

Dawn and Oil Springs—Dry Wells

The company exploited these fields, but the venture was not very successful; consequently, it was necessary to search for additional supply, and we consider the expense was incurred in good faith. We have, therefore, allowed \$50,000 for dry wells in this case.

DAWN WELLS—DRY

No.	Date	Depth	Drive pipe		Casing				Cost
			12½ in.	10 in.	8¼ in.	6⅝ in.	5⅞ in.	6¼ in.	
2	Oct. 1920	ft. 3,968	ft. 68	ft.	ft.	ft.	ft.	ft.	\$15,341.16
5	June 1922	2,160	.....	.....	22	21	.....	.....	2,622.10
8	Aug. 1922	2,185	.....	.....	.....	.....	.....	.....	2,962.99
9	Aug. 1922	2,198	.....	.....	.....	.....	.....	.....	3,509.76
10	Nov. 1922	1,980	.....	.....	25	.....	.....	.....	3,428.48
	Totals.....	12,491	68	.....	45	21	.....	.....	\$27,864.49

OIL SPRINGS' WELLS—DRY

No.	Date	Depth	Drive pipe		Casing				Cost
			12½ in.	10 in.	8¼ in.	6⅝ in.	5⅞ in.	6¼ in.	
150	June 1914	ft. 2,132	ft.	ft.	ft. 95	ft.	ft.	ft. 28	.....
157	Oct. 1914	*2,000	.....	40	20	.....	.....	.....	.....
146	June 1914	2,056	.....	.....	.....	.....	.....	.....	.....
147	May 1914	2,140	.....	.....	.....	.....	.....	.....	.....
148	May 1914	2,127	.....	.....	.....	.....	.....	.....	.....
149	May 1914	2,052	.....	.....	.....	.....	.....	.....	.....
151	July 1914	2,063	.....	.....	.....	.....	.....	.....	.....
152	Aug. 1914	2,070	.....	.....	.....	.....	.....	.....	.....
153	July 1914	2,074	.....	.....	.....	.....	.....	.....	.....
154	Aug. 1914	1,878	.....	.....	.....	.....	.....	.....	.....
155	Aug. 1914	2,008	.....	.....	.....	.....	.....	.....	.....
	Totals.....	22,600	.....	.....	.....	.....	.....	.....	.....

*Estimated.

DAWN FIELD—WELL HEADS

Quantity	Item	Unit cost	Reproduction cost new
	JOHNSTON WELL No. 7		
1	3 in. heavy cast tee.....		\$2.43
2	3 in. Attwood high pressure gate valves.....	\$22.60	45.20
2	3 in. heavy cast elbows.....	1.50	3.00
4	3 in. nipples.....	.43	1.72
1	3 in. flange union, heavy cast.....		1.82
1	3 in. x 1 in. bushing.....		.23
1	1 in. bushing.....		.05
1	1 in. brass stop cock.....		1.03
1	Set tubing clamps.....		8.00

DAWN FIELD—WELL HEADS—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
McDERMIT No. 1 WELL			
1	3 in. heavy cast tee.....		\$2.43
2	3 in. Attwood high pressure gate valves.....	\$22.60	45.20
2	3 in. heavy cast elbows.....	1.50	3.00
4	3 in. nipples.....	.43	1.72
1	3 in. flange union, heavy cast.....		1.82
1	3 in. x 1 in. bushing.....		.23
1	1 in. bushing.....		.05
1	1 in. brass stop cock.....		1.03
1	Set tubing clamps.....		8.00
1	Separator drip unit.....		90.00
No. 3 CONNYBEARE			
1	3 in. heavy cast tee.....		2.43
2	3 in. Attwood high pressure gate valves.....	22.60	45.20
2	3 in. heavy cast elbows.....	1.50	3.00
4	3 in. nipples.....	.43	1.72
1	3 in. heavy cast flange union.....		1.82
1	3 in. x 1 in. bushing.....		.23
1	1 in. bushing.....		.05
1	1 in. brass stop cock.....		1.03
1	Set tubing clamps.....		8.00
No. 6 NURSE WELL			
1	3 in. heavy cast tee.....		2.43
2	3 in. Attwood high pressure gate valves.....	22.60	45.20
2	3 in. heavy cast elbows.....	1.50	3.00
4	3 in. nipples.....	.43	1.72
1	3 in. flange union, heavy cast.....		1.82
1	3 in. x 1 in. bushing.....		.23
1	1 in. bushing.....		.05
1	1 in. brass stop cock.....		1.03
1	Set tubing clamps.....		8.00
1	Separator drip unit.....		90.00
No. 4 MED WELL			
1	3 in. heavy cast tee.....		2.43
2	3 in. Attwood high pressure gate valves.....	22.60	45.20
2	3 in. heavy cast elbows.....	1.50	3.00
4	3 in. nipples.....	.43	1.72
1	3 in. flange union, heavy cast.....		1.82
1	3 in. x 1 in. bushing.....		.23
1	1 in. bushing.....		.05
1	1 in. brass stop cock.....		1.03
1	Set tubing clamps.....		8.00
1	Separator drip unit.....		90.00
	Labour, team and miscellaneous.....		92.40
	Total.....		\$708.42

COMPRESSOR STATION

As there are no complete plans of the compressor station available and as much of the equipment therein is not exposed to view, we prefer to base the appraisal upon the book records of the expenditures actually incurred rather than to make an inventory which may not be entirely reliable. The company's books show that the compressor plant cost \$184,348 in 1914. This amount, however, included the cost of other parts named below, the reproduction cost new of which is as follows:—

Machine shop.....	\$5,000
Office.....	900
Three houses.....	10,600
Tenement houses.....	7,000
Water pump house.....	5,000
Water mains.....	3,500
Sewers and drains.....	2,400
Machinery.....	29,235
Elevated water tank.....	4,000
Land, say.....	1,000
Regulator, part.....	5,000
Total.....	<u>\$73,635</u>

The probable original cost in 1914 of the above items is calculated as follows: Of the total of \$73,635, the cost for construction is \$39,400, and for machinery, \$34,235.

$$\$39,400 \times \frac{97.2}{193.1} = \$19,800$$

$$\$34,235 \times \frac{60}{100} = \$20,540$$

$$\text{Probable original cost} = \$40,340$$

Deducting \$40,340 from \$184,348 leaves the sum of \$144,008 as the probable original cost of the compressor plant and building, and this may be divided into its component parts of \$62,260 for machinery, and \$81,748 for construction.

The present cost of the plant would be:—

$$\$62,260 \text{ for machinery in 1914} \times \frac{100}{60} = \$103,800$$

$$\$81,748 \text{ for construction in 1914} \times \frac{193.1}{97.2} = \$162,400$$

$$\text{Total.....} \underline{\$266,200}$$

The present reproduction cost new of the compressor plant would be about \$266,200.

The compressor plant is not in use and has not been in operation for some years.

Depreciation

The condition of the compressor plant is good.

The physical depreciation of the machinery is estimated at 5 per cent.

per annum for nine years, and of the buildings at 3 per cent. Therefore the aggregate will be:—

$$\begin{array}{r} 45 \text{ per cent. on } \$103,800 = \$46,710 \\ 27 \text{ per cent. on } \$162,400 = \$43,800 \\ \hline \text{Total,} \dots\dots\dots \$90,510 \end{array}$$

The accrued retirement reserve for the compressor plant should be based on the ratio of nine years to the total life of the Tilbury field from 1914. We estimate this life from the inception of this undertaking to be about twenty-one years. Therefore the reserve, less the residual value of 20 per cent. of the reproduction cost new, or \$53,240, on the straight line basis, would be about

$$\$212,960 \times \frac{9}{21} = \$91,270$$

and on a 5 per cent. sinking fund basis,

$$\$212,960 \times 9 \times 0.02799 = \$53,658.$$

If the original cost of \$144,008, less 20 per cent., or \$115,206 was retired on the straight line basis, the amount would be \$49,370.

SUMMARY OF COLLECTING LINES

The following is a summary of the cost of the collecting lines; the inventory follows. The unit cost for this work includes all labour, teaming, and pipes; miscellaneous and unavoidable waste are covered by 3 per cent. of the cost of pipes, and 5 per cent. of the total is allowed for contingencies. The cost of fittings is stated in each case as we found the conditions varied too much to safely state a percentage.

COLLECTING LINES

Item	Length	Bur. or surf.	Unit cost	Repro- duction cost new
TILBURY FIELD				
8 inch lines.....	miles 5.05	B.	\$9,820.80	\$49,595.04
do fittings, No. 3.....			110.14	330.42
6 inch lines.....	4.005	B.	7,339.20	29,393.50
do fittings, No. 6.....			60.36	362.16
4 inch lines.....	{ 0.160	S.	4,065.60	650.49
do fittings, No. 5.....	{ 1.021	B.	4,224.00	4,312.70
			25.59	127.95
3 inch lines.....	{ 12.485	S.	2,877.60	35,926.84
do fittings, No. 168.....	{ 16.179	B.	3,009.60	48,692.32
			19.38	3,239.82
2½ inch lines.....	0.122	B.	2,270.40	276.99
do fittings, No. 2.....			14.50	29.00
2 inch lines.....	{ 1.183	S.	1,636.80	1,936.33
do fittings, No. 14.....	{ 1.066	B.	1,742.40	1,857.40
			10.17	142.38
1½ inch lines.....	0.042	S.	1,056.00	44.35
do fittings, No. 1.....			3.02	3.02
5⅝ inch lines.....	0.20	B.	5,332.80	1,066.56
do fittings, No. 1.....			60.00	60.00
1 inch lines.....	0.792	B.	792.00	627.26
do fittings, No. 3.....			1.61	4.83
Total.....				\$178,679.36

COLLECTING LINES—*Continued.*

Item	Length	Bur. or surf.	Unit cost	Reproduc- tion cost new
DOVER FIELD				
4 inch lines.....	ft. 3,590	S.	\$0.77	\$2,764.30
do fittings, No. 1.....			25.59	25.59
3 inch lines.....	10,917	S.	.54½	5,949.77
do fittings, No. 8.....			19.38	155.04
Fittings, near orifice meter.....				458.98
Total.....				\$9,353.68
DAWN FIELD				
4 inch lines.....	miles 2.55	S.	\$4,065.60	\$10,367.28
do fittings, No. 1.....			25.59	25.59
3 inch lines.....	4.115	S.	2,877.60	11,841.32
do fittings, No. 6.....			19.38	116.28
Total.....				\$22,350.47
Grand total.....				\$210,383.58

Actual Cost of Collecting Lines

We are instructed to state the cost of the collecting lines. Since the company's books do not reveal this information, because the system of accounting is not adapted to show the segregated expenditures, we are obliged to adopt other methods of arriving at the probable cost. We will submit our estimates based upon three series of index numbers. The lines which were laid prior to 1915 are separated from those laid in 1915 and subsequent years, and the costs are based upon the standard index number of 100 for 1914.

Based upon "Engineering News-Record" construction cost index numbers:—

Year	Amount of work done	Index number	Multiple
1915.....	\$2,300	92.6	212,934
1916.....	3,700	147.0	543,900
1917.....	23,800	181.0	4,307,800
1918.....	4,250	189.0	803,250
1919.....	7,660	198.0	1,516,680
1920.....			
1921.....	9,110	208.0	1,894,880
1922.....	22,200	174.0	3,862,800
1923.....	525	211.0	110,775
	\$73,545	.....	13,253,019

$$\text{Average index number} = \frac{13,253,019}{73,545} = 180.2$$

Total reproduction cost of collecting lines, etc..... \$210,384

Laid in 1915 and later..... 73,545

Laid in 1914 and earlier..... \$136,839

Index number for July, 1923, was 220

$$\$136,839 \times \frac{100}{220} = \$62,200$$

$$\$73,545 \times \frac{180.2}{220} = 60,240$$

Probable cost on this basis \$122,440

Based upon Canadian steel pipe index numbers (see page 19):—

Year	Amount of work done	Index numbers	Multiple
1915.....	\$2,300	103	236,900
1916.....	3,700	154	569,800
1917.....	23,800	239	5,688,200
1918.....	4,250	279	1,185,750
1919.....	7,660	245	1,876,700
1920.....	.....	.....	.....
1921.....	9,110	217	1,976,870
1922.....	22,200	162	3,596,400
1923.....	525	182	95,550
	\$73,545	.....	15,226,170

Index number for July, 1923, was 192.5

$$\text{Average index number} = \frac{15,226,170}{73,545} = 207$$

Total reproduction cost..... \$210,384
Laid in 1915 and later..... 73,545

Laid in 1914 and earlier..... \$136,839

$$\$136,839 \times \frac{100}{192.5} = \$71,080$$

$$\$73,545 \times \frac{207}{192.5} = 79,100$$

Probable cost on this basis=\$150,180

Based on composite Canadian steel pipe and labour index numbers:—

Year	Total	Material			Labour		
		Cost	Index No.	Multiple	Cost	Index No.	Multiple
1915.....	\$2,300	\$1,840	103	190,120	\$460	101.4	46,644
1916.....	3,700	2,960	154	455,840	740	105.7	78,218
1917.....	23,800	19,040	239	4,555,560	4,760	117.5	559,300
1918.....	4,250	3,400	279	948,600	850	139.8	118,830
1919.....	7,660	6,127	245	1,501,360	1,533	160.4	245,890
1920.....	.....	.....	.....	.....	.....	.....	.....
1921.....	9,110	7,288	217	1,581,500	1,822	186.1	339,076
1922.....	22,200	17,760	162	2,877,160	4,440	176.8	784,992
1923.....	525	420	182	78,440	105	180.0	18,900
	\$73,545	\$55,835	.....	12,183,580	\$14,710	.....	2,191,850

$$\begin{aligned}\text{Average index number for material} &= \frac{12,183,580}{55,835} = 207 \\ \text{and for labour} &= \frac{2,191,850}{14,710} = 149\end{aligned}$$

Total reproduction cost.....	\$210,384
Laid in 1915 and later.....	73,545
Laid in 1914 and earlier.....	<u>\$136,839</u>

1914 AND EARLIER

Material.....	\$109,459
Labour.....	27,380
	<u>\$136,839</u>

1915 AND LATER

Material.....	\$58,835
Labour.....	14,710
	<u>\$73,545</u>
	<u>\$210,384</u>

The probable original cost on this basis would, therefore, be:—

$\$109,459 \times \frac{100}{192.5} = \$56,860$	
$\$27,380 \times \frac{100}{180} = \$15,210$	
$\$58,835 \times \frac{207}{192.5} = \$63,280$	
$\$14,710 \times \frac{149.0}{180} = \$12,170$	
Total.....	<u>\$75,450</u>
	<u>\$147,520</u>

SUMMARY

By "Engineering News-Record" index numbers.....	\$122,440
By Canadian steel pipe do	150,180
By composite Canadian steel pipe and labour do	147,520

These costs are based on the assumption that new material was used throughout.

Depreciation, Collecting Lines

The general condition of the collecting lines from the standpoint of normal operating efficiency is good, and we do not consider that any expenditure for restoration would be necessary at present, as this section of the plant is operating satisfactorily.

The physical depreciation of the collecting lines has been observed by exposure, and we consider that the lines have depreciated about 21.6 per cent., which represents about \$45,490.82.

The accrued retirement reserve should be based upon the ratio of the period elapsed since the lines were laid, to the total life time of the fields. The average year for the collecting lines is about 1914, and therefore nine years have elapsed. We estimate that the Tilbury gas field will continue to supply gas for another 12 years. The accrued retirement reserve, less the residual value of 25 per cent. of the reproduction cost, will therefore be:—

TILBURY FIELD

On the straight line basis:

$$75 \text{ per cent. of } \$178,679 = \$134,010 \times \frac{9}{21} = \$57,433$$

On the five per cent. sinking fund basis (9 out of 21 years):

$$\$134,010 \times 9 \times 0.02799 = \$33,758$$

DOVER FIELD

On the straight line basis:

$$75 \text{ per cent. of } \$9,354 = \$7,014 \times \frac{4}{16} = \$1,754$$

On the five per cent. sinking fund basis (4 out of 16 years):

$$\$7,014 \times 4 \times 0.0423 = \$1,186$$

DAWN FIELD

On the straight line basis:

$$75 \text{ per cent. of } \$22,350 = \$16,760 \times \frac{3}{15} = \$3,352$$

On the five per cent. sinking fund basis (3 out of 15 years):

$$\$16,760 \times 3 \times 0.04634 = \$2,469$$

TOTALS

On the straight line basis..... \$62,539
On the five per cent. sinking fund basis..... \$37,413

FOR TILBURY COLLECTING LINES, SEE INSERT OPPOSITE

DOVER FIELD—COLLECTING LINES

4 INCH LINES

From pumphouse to orifice meter, 0.68 miles, or 3,590 feet at 77 cents..... \$2,764.30

3 INCH LINES

From No. 16 to meter house..... 3,288 ft.
do No. 14 to No. 7 drip..... 577 ft.
do No. 13 drip to pumphouse..... 1,860 ft.
do No. 12 to No. 7 drip..... 632 ft.
do No. 7 drip to orifice meter,
0.68 miles, plus 470 feet..... 4,060 ft.
do No. 1 to No. 7 drip..... 500 ft.

Total..... 10,917 ft. at 54.5 cents..... \$5,949.77

COLLECTING LINES—TILBURY FIELD

Line	8 in.		6 in.		4 in.		3 in.		2 in.		5½ in.		1½ in.		2½ in.		1 in.		Efficiency
	Bur.	Surf.	Bur.	Surf.	Bur.	Surf.	Bur.	Surf.	Bur.	Surf.	Bur.	Surf.	Bur.	Surf.	Bur.	Surf.	Bur.	Surf.	
	miles	miles	miles	miles	miles	miles	miles	miles	miles	miles	miles	miles	miles	miles	miles	miles	miles	miles	Per cent.
Talbot Rd., Baldwin to Shanks Rd..																			
Talbot Rd. at 113.....	0.75																		
2nd Concession to 137.....						1,000 ft.				60 ft.									
Shanks Rd., N. of Talbot						66 ft.													
Lane to No. 41.....							0.35												
do								240 ft.											
Road to 219.....								0.15											
Bypass to 210.....								80 ft.											
J. R. Shanks Rd.....					0.35			0.74			0.20								80
Lane to 203.....																			
Lane to 120-118.....		0.10			0.10			0.15											
Road west of 10 in. field line.....		0.39					0.36												90
Road to 77 (Scale).....							0.20												
Road east of 10 in. field line.....							0.20												
Lane to 104.....								0.51											
212 to Northern.....																			
Northern to Windsor					0.10			0.40											
Lane to 181.....								0.1											
Town line to 141.....								0.16											
100 to 6 in. field line.....					0.72														
Road 142-184.....		0.05																	
Road 184, northward		0.70					0.15												94
Talbot road to corner 177								0.05											
Lane to 235.....								0.58											
Violetta road to No. 14.....								0.27											
Chatham line to fence No. 11									0.55										
Chatham to corner 188.....								0.36											
Road 94-193.....								0.30											
Lane to 61.....								0.405											
Lane past No. 61.....								0.14											
Gate to corner 20 112								1.57											80
Road 86 to the gate.....								0.5											
Gate to the town line.....								0.50											75
Merlin road.....		0.82																	75
6 in. field line—Port Alma																			
Miffln side road.....		1.48																	80
Askew side road.....																			
From well tabulation.....	5.05	4.005	0.990	0.031	0.16	4.679	6.285	1.066	0.495	0.70	0.688	0.043	0.1	0.72					
Total miles.....	5.05	4.005	1.071	0.10		16.179	12.485	1.066	1.183	0.20	0.042	0.122	0.792						

Quan- tity	Item	Unit cost	Repro- duction cost new
FITTINGS ON 4 INCH LINE NEAR ORIFICE METERS			
1	4 in. separator		\$40.00
1	8 in. x 4 in. swedge nipple		6.37
1	4 in. nipple .....		.72
1	4 in. heavy cast ell.		2.68
1	8 in. x 1 in. heavy cast cap.		2.56
1	1 in. nipple .....		.07
1	1 in. brass stop cock		1.03
FITTINGS ON 3 INCH LINE			
1	Double rivetted steel tank, 10 ft. x 4 ft.		300.00
1	8 in. x 3 in. swedge nipple		7.27
2	3 in. heavy cast ells.	1.53	3.06
2	3 in. heavy cast flange unions.	1.82	3.64
1	8 in. x 4 in. swedge nipple		6.37
1	4 in. heavy cast ell.		2.68
1	4 in. x 3 in. swedge nipple		1.57
1	3 in. x 2 in. swedge nipple		1.18
1	3 in. high pressure gate valve.		22.60
3	3 in. nipples .....	.43	1.29
2	2 in. tees .....	.44	.88
1	2 in. plug .....		.08
2	2 in. nipples .....	.16	.32
1	2 in. light cast flange. ....		.81
120 ft.	2 in. pipe .....	.24	28.80
	Labour, team and miscellaneous.		25.00
Total.			\$458.98

DAWN FIELD—COLLECTING LINES

	4 Inch	3 Inch
	miles	miles
Along road	2.55	
do		0.85
From well tabulation.		3.265
Total.	2.55	4.115

TRANSMISSION LINES

Notes on History of Development

In order that you may be in possession of the data regarding the develop-
ment of the transmission pipe lines, and incidentally that of the distribution
lines, we beg to submit the following information. This information has
been collected mainly through the instrumentality of Mr. F. W. James,
the late manager.

Historical Notes re Gas Lines

Windsor Line.—The original line laid in 1909 was an 8-inch screw pipe from the Gore to the west of Ruscomb and a 10-inch Dresser coupling pipe from near Ruscomb to Windsor. (New pipe.)

In 1912-13 the 8-inch line was extended eastwards from the Gore to Port Alma, via Baldwin side road, but this was taken up in 1922 and existing 10 and 12-inch field lines were utilized as a main line.

In 1914 an additional 8-inch Dresser coupling line was laid from Port Alma westward to near Ruscomb, paralleling the older main from the Gore westwards. (New pipe.)

In 1921 about 2.45 miles of the older 8-inch Windsor line lying east of Tilbury road, was removed from the road into the field. Second-hand pipes from the Sarnia line were used with alternate welded joints and Dresser couplings to replace the defective pipes in this section.

About one mile of the older Windsor line lying west of Comber road was also replaced by selected second-hand pipe with alternate welded joints and Dresser couplings.

In 1922 about three miles of the older 8-inch Windsor line west of Tilbury road were replaced by selected second-hand pipe with welded joints and Dresser couplings.

About one mile of the older Windsor line at Stevenson was also replaced by selected second-hand pipe with welded joints and Dresser couplings.

Tilbury Line from Windsor Line.—Three-inch new screw pipe was laid in 1912 from Windsor line through Tilbury to the Dauphin pump, southeast corner of lot 7, concession II, Township of Tilbury East, and in 1913 this was extended to the Farmers' pump and Charon's brick yard, the line to the brick yard being taken up again in 1917.

Jeannette Creek Line.—In 1915 a 2½-inch second-hand screw pipe line was laid from the 3-inch line to Tecumseh road where a regulator was set and a 3-inch low pressure line laid eastwards on the Tecumseh road to Jeannette creek.

Comber Line.—Three-inch new screw pipe was laid in 1909 from Windsor line to Comber.

St. Joachim Line.—St. Joachim line was laid from Windsor line to St. Joachim in 1912, with 2-inch second-hand screw pipe, and 1¼-inch new screw pipe from St. Joachim to Deerbrook was laid in 1915. The line was relaid in 1921.

Belle River Line.—The Belle River line was laid from Windsor line in 1910 with 3-inch second-hand screw pipe.

South Woodslee.—The South Woodslee line was laid from Windsor line in 1909 with new 2-inch screw pipe.

Essex Line.—The Essex line was laid from Windsor line in 1909, with new 3-inch screw pipe.

Maidstone Line.—The Maidstone line was laid from Windsor line in 1910 with new 2-inch screw pipe.

Tecumseh Line.—The Tecumseh line from Windsor line was originally 2-inch screw laid in 1910.

This was replaced by 5 $\frac{5}{8}$ -inch second-hand casing in 1912, taken from the Northern line (Dresser couplings). The 4 $\frac{1}{4}$ -inch and 4 $\frac{7}{8}$ -inch Dresser coupling line on Grand Maris road from Windsor line to Pillette Corner was laid in 1921, with 4 $\frac{1}{4}$ -inch casing from the Ridgetown line and 4 $\frac{7}{8}$ -inch casing from the Halliday well.

Northern Line.—The Northern line was laid in 1909 from lot 178, back line, Talbot lots to Wallaceburg. The southern part to Port Alma was originally laid by the Canadian Gas Company as a field line, but was made a part of the Northern line when the Union Natural Gas Company took over the property of the Canadian Gas Company in 1919.

The pipes were 5 $\frac{5}{8}$ -inch casing with Dresser coupling to M.C.R.R.; 6-inch and 8-inch screw from there to Wallaceburg. The 5 $\frac{5}{8}$ -inch pipe was replaced in 1912 by new 6-inch Dresser coupling pipe.

River Road from Northern Line.—Taken over from the consumers in 1916, and rebuilt with 2-inch second-hand screw pipe. The 2-inch screw pipe was relaid in 1922. The 1 $\frac{1}{4}$ -inch screw pipe was new.

Prairie Siding Line.—The Prairie Siding line from the Northern line was laid in 1917 with 2-inch second-hand screw pipes.

Chatham Line.—The Chatham line was laid originally of 3-inch new screw pipe from Fletcher to Chatham regulator, in 1906, by the Volcanic Oil and Gas Company. The 3-inch line was replaced in 1907 by a 6-inch, 6 $\frac{1}{4}$ -inch and 8-inch second-hand pipe by the Iroquois Pipe Line Company from Fletcher to Chatham, with an extension to Port Alma. The pipe, which came from Titusville Gas Company, was 6 $\frac{1}{4}$ -inch casing with Dresser coupling and 6-inch screw pipe, 19 to 20 pounds per foot. The 6-inch line from lot 181 to Port Alma, and in 1914, is still in use.

The above pipes were again replaced from the southeast corner of lot 18, concession V, Raleigh to Ellis, southeast corner lot 13, concession XIII, Tilbury East, with 8-inch new Page-Hersey, 25-pound pipe, plain ends with Dresser couplings, by the Union Natural Gas Company in 1914.

The length from Ellis corner to the Gore was relaid with 8-inch selected second-hand pipe, welded joints, and Dresser couplings, in June, 1923.

The portion from Jenner side road to Chatham was replaced in 1922 by 11,713 feet of second-hand 8-inch pipes, Dresser couplings, taken from Sarnia line by the Union Natural Gas Company.

Charing Cross Line.—The Charing Cross line from Chatham was laid in 1908 with new 3-inch screw pipe. The portion of 4-inch pipe formerly laid from Charing Cross to Blenheim was removed in 1922 and used in Dawn.

Valetta Line.—The line to Valetta and Tilbury from Chatham line along the Middle road laid by the Tilbury Town Gas Company in 1907, was originally 2-inch screw, 3-inch pipe, and 4 $\frac{1}{4}$ -inch casing with Dresser coupling. The 2-inch pipe was replaced in 1914 by new 4-inch pipe with Dresser coupling. In 1916 this line was extended from Valetta to the Chatham line with 3-inch pipe, which is still in use.

River Road from Sarnia Line.—Two-inch second-hand screw pipe laid in 1915; 1 $\frac{1}{2}$ -inch screw pipe laid in 1919 was new Page-Hersey well tubing.

Ridgetown Line.—The Ridgetown line from Port Alma was laid as follows: The pipe from Port Alma eastward to lot 23, concession III, Harwich, is 6-inch

screw pipe and 6¼-inch casing with Dresser coupling, selected second-hand laid in 1914, taken from the old Chatham and Petrolia lines and replacing a former 4¼-inch casing laid in 1909. From lot 23, as above, to Ridgetown a second-hand 8-inch pipe from Sarnia line with welded joints and Dresser couplings was laid in 1918.

Highgate Line.—The Highgate line from Ridgetown was originally two 2-inch lines, one laid in 1909 and the other in 1912, both screw pipes.

These were replaced in 1915 by second-hand 4¼-inch casing from the old Ridgetown line with Dayton couplings. The pipe southward to the brickyard is 3-inch second-hand screw laid in 1909.

Blenheim Line.—The Blenheim line from Ridgetown line was second-hand 3-inch screw, and 4¼-inch casing with Dresser coupling, laid in 1912. The 3-inch screw pipe was replaced by second-hand 4¼-inch casing with Dayton couplings taken from Ridgetown line, in 1914.

Shrewsbury Line.—Laid in 1915 from New Scotland with 1¼ and 1-inch new screw pipe.

Rondeau Line.—Laid in 1915 from Ridgetown line with second-hand 2-inch screw pipe.

New Scotland Line.—Laid from Ridgetown line with new 2-inch screw pipe in 1915.

Palmyra Line.—With 2-inch second-hand screw pipe laid from Ridgetown line in 1912 and relaid in 1922.

River Road.—Second-hand 2-inch screw pipes laid in 1916.

Cedar Springs Line.—Cedar Springs line from Ridgetown line, 2-inch new screw pipe laid in 1910 and relaid in 1915.

Sarnia Line.—Sarnia line from Port Alma to concession IV, Township of Moore, was originally 8-inch old screw wrought iron pipe laid in 1909; from concession IV to concession XI, Township of Moore, 10-inch Mannesmann wrought iron pipe with collar leak clamps laid in 1909; from concession XI to Sarnia, 8-inch second-hand wrought iron screw pipe.

The present line is constituted as follows: From Port Alma to concession IX, Dover township, replaced by new 10-inch Dresser coupling pipe in 1916.

From concession IX to lot 28 (Baldoon), Dover township, replaced in 1915 by new 8-inch Dresser coupling pipe.

From lot 28 to concession IV, Moore township, replaced in 1916 by new 10-inch plain end Dresser coupling pipe.

From concession IV, Moore township, to concession XI, replaced in 1912 by new 12-inch O.D. plain end Dresser coupling pipe.

From concession XI, Moore township, to Sarnia, second-hand wrought iron 8-inch screw pipe laid in 1909.

Sarnia line from concession X, Moore township, the main line was duplicated to the City of Sarnia by 8-inch second-hand selected pipe, from the old Sarnia line, partly welded and partly Dresser coupling, laid in 1918.

Petrolia Line.—The Petrolia line was originally second-hand 6¼-inch casing screw pipe laid in 1908. This was replaced by new 6-inch pipe with Dresser coupling in 1914.

Oil City Line.—New 6-inch Dresser coupling line was laid in 1914 from Petrolia line to Oil Springs.

Dawn Line.—The Oil Springs line was extended in 1914 to lot 24, concession VII, Township of Dawn, with new 3-inch screw pipe. This 3-inch line was taken up in 1917. From the end of 6-inch line at Oil Springs a 4-inch second-hand pipe line, partly screw, partly welded, and partly Dresser coupling, was laid to concession VII and side road 25 in 1922.

Corunna Line.—This was originally 2-inch screw laid from the 8-inch main to Corunna in 1911. This was replaced by another second-hand 2-inch screw pipe from Mooretown line in 1914, and this was supplemented in 1920 by another 2-inch second-hand screw pipe line from the new 8-inch Sarnia line on concession X.

Mooretown Line.—Four-inch new Dresser coupling line from Sarnia line to Mooretown and Courtright, laid in 1914.

Brigden Line.—This was originally a 2-inch line laid in 1909, replaced by new 4-inch Dresser coupling line in 1914, and 3-inch second-hand screw in 1920.

Sombra Line.—This was laid in 1915 with $4\frac{1}{4}$ -inch and $6\frac{1}{4}$ -inch second-hand Dresser coupling casing to the river, and 2-inch second-hand screw line along the river to Port Lambton, laid in 1916.

Dresden Line.—This was laid in 1910 with second-hand $4\frac{1}{4}$ -inch casing Dresser couplings.

Dover Centre Line.—This is a $1\frac{1}{2}$ -inch new screw pipe laid in 1915.

Paincourt Line.—This is a 2-inch second-hand screw pipe laid in 1910, now replaced between Creek road and Fourth concession road with $4\frac{1}{4}$ -inch casing taken from the Ridgetown line, laid in 1915.

Dover Field Lines—3-inch second-hand screw pipe line along concession V, Dover, in 1917; 4-inch new pipe line laid in 1918; 2-inch second-hand oil line laid in 1918.

A summary of the inventory of all transmission lines will be found on page 76. The inventory with prices and costs is appended for the benefit of those who may be interested.

Unit Costs

The unit costs include labour, team, and pipes; fittings, miscellaneous, and unavoidable waste are covered by five per cent. of the cost of the pipes; and contingencies are provided for by five per cent. on the total. We have based our estimate on prices of Canadian pipes which, of necessity, closely approximate the cost of imported material. The authorities allow one-half of the thirty per cent. duty to be rebated in the case of 4-inch to 10-inch imported pipes, but we have no occasion to apply this rebate.

Original Cost

The transmission lines were laid in different years, from about 1909 to the present time. In many instances the existing pipes are replacements of former lines, but we are unable to go back beyond the existing ones.

TRANSMISSION LINES—SUMMARY

Page		Reproduction cost new
80	Windsor—Maidstone—Middle road.....	\$287,930.81
80	Windsor, old line.....	246,642.48
81	Windsor, new line.....	226,195.20
81	Walker road.....	10,501.92
81	Maidstone portion.....	2,122.80
82	Tecumseh road.....	30,237.49
82	Essex line.....	8,956.20
82	Belle river.....	15,424.50
82	St. Joachim.....	7,801.52
83	Deerbrook.....	1,251.75
83	South Woodslee.....	1,669.00
83	Comber.....	5,543.97
83	Tilbury Town line, Jeannette creek, etc.....	40,807.11
84	Valetta.....	28,860.48
84	Chatham, orifice meter connection.....	109.62
84	Stevenson, orifice meter connection.....	262.00
84	Sarnia line.....	798,967.95
85	Sarnia bypass.....	87,120.00
86	Northern line.....	248,058.25
86	Chatham line.....	217,594.95
87	Ridgetown line.....	236,126.00
88	Highgate.....	22,433.41
88	Palmyra.....	4,245.60
88	Wallaceburg bypass and connection.....	13,335.09
89	Tupperville-Dresden.....	37,342.80
89	Wallaceburg.....	1,376.85
89	Petrolia.....	73,305.54
89	Eddy Mills.....	106,102.03
90	Mooretown and Courtright.....	33,593.47
90	Corunna—River road.....	12,471.45
91	Brigden line.....	11,266.99
91	Sombra—River road.....	27,339.10
91	Port Lambton.....	6,868.26
91	Wilkesport.....	1,415.20
91	Copleston.....	2,632.99
92	Paincourt.....	1,362.13
92	Dover—Concessions IV and V.....	40,749.30
92	Blenheim.....	5,100.20
92	Fletcher.....	13.40
93	Merlin.....	1,698.15
93	Morpeth.....	97.48
94	Fittings on town line, opposite Dover meter house.....	155.31
	River crossings.....	8,000.00
	Total.....	\$2,913,088.75

To arrive at the probable original cost of the transmission lines, we have applied similar methods to those used in connection with collecting lines.

Based upon "Engineering News-Record" construction costs index numbers, see page 17, and a standard of 100 for 1914 and previous years, we have the following calculations:—

Year	Amount of work done	Index No.	Multiple
1915.....	\$82,603	92.58	7,643,857
1916.....	600,340	147.35	88,360,990
1917.....	13,817	181.24	2,504,193
1918.....	186,544	189.20	35,294,125
1919.....	no lines laid	.....	.....
1920.....	12,165	251.28	3,056,682
1921.....	49,354	207.78	10,254,774
1922.....	69,292	174.45	12,087,989
1923.....	8,448	211.00	1,782,528
	\$1,022,563		160,985,138

$$\text{Average index number} = \frac{160,985,138}{1,022,563} = 157.4$$

Total reproduction cost of transmission lines..... \$2,913,089
 Work done 1915 to 1923..... 1,022,563

Balance 1914 and earlier..... \$1,890,526
 Index number for July, 1923, is 220

$$\$1,890,526 \times \frac{100}{220} = \$860,000$$

$$\$1,022,563 \times \frac{157.4}{220} = \$731,720$$

Probable total original cost = \$1,591,720

Based on the Canadian steel pipe prices index numbers, see page 19, we have:—

Year	Amount of work done	Index No.	Multiple
1915.....	\$82,603	103	8,508,109
1916.....	600,340	154	92,452,360
1917.....	13,817	239	3,302,263
1918.....	186,544	279	52,045,776
1919.....			
1920.....	12,165	271	3,296,715
1921.....	49,354	217	10,709,818
1922.....	69,292	162	11,225,304
1923.....	8,443	182	1,537,536
	\$1,022,563		183,077,881

$$\text{Average index number} = \frac{183,077,881}{1,022,563} = 179.1$$

Total reproduction cost of transmission lines..... \$2,913,089
 Work done 1915 to 1923..... 1,022,563

Balance 1914 and earlier..... \$1,890,526

Index number for July, 1923, is 192.5

$$\$1,890,526 \times \frac{100}{192.5} = \$982,500$$

$$\$1,022,563 \times \frac{179.1}{192.5} = \$951,010$$

Probable total original cost = \$1,933,510

Using the composite index numbers for Canadian steel pipes and Canadian labour, and dividing the total reproduction cost into labour and materials as below, we have:—

Total reproduction cost of transmission lines.....	\$2,913,089
Work done 1915 to 1923.....	1,022,563
Work done 1914 and earlier.....	\$1,890,526
Work done 1914 and earlier, materials.....	\$1,512,521
labour.....	378,005
Total.....	\$1,890,526
Work done 1915 and later, materials.....	\$818,050
labour.....	204,513
Total.....	\$1,022,563

Year	Total	Material			Labour		
		Cost	Index No.	Multiple	Cost	Index No.	Multiple
1915.....	\$82,603	\$66,083	103	6,806,549	\$16,520.00	101.4	1,676,780
1916.....	600,340	480,270	154	73,961,580	120,070.00	105.7	12,691,399
1917.....	13,817	11,054	239	2,641,906	2,76.00	117.5	324,652
1918.....	186,544	149,235	279	41,636,565	37,309.00	139.8	5,215,798
1919.....							
1920.....	12,165	9,732	271	2,637,372	2,433.00	192.1	467,379
1921.....	49,354	39,483	217	8,567,811	9,871.00	186.1	1,820,244
1922.....	69,292	55,434	162	8,980,308	13,858.00	176.8	2,450,094
1923.....	8,448	6,759	182	1,230,138	1,689.00	180.0	304,020
	\$1,022,563	\$818,050		146,462,229	\$204,513.00		24,950,363

$$\text{Average index number for material} = \frac{146,462,229}{818,050} = 179$$

$$\text{and for labour} = \frac{24,950,363}{204,513} = 122$$

The probable original cost on this basis would, therefore, be

$$\begin{aligned}
 & \$1,512,521 \times \frac{100}{192.5} = \$785,700 \\
 & \$378,005 \times \frac{100}{180} = \$210,000 \\
 & \$818,050 \times \frac{179}{192.5} = \$760,840 \\
 & \$204,513 \times \frac{122}{180} = \$138,600 \\
 & \text{Total} \dots\dots\dots \$1,895,140
 \end{aligned}$$

SUMMARY

By "Engineering News-Record" index numbers.....		\$1,591,720
By Canadian steel pipe	do	1,933,510
By composite pipe and labour	do	1,895,140

These costs are based upon the assumption that new materials were used throughout.

Transmission Lines—Depreciation

The general condition of the transmission lines from the point of view of normal operating efficiency is reasonably satisfactory. We do not consider that much expenditure is necessary to enable operation to continue as at present. If the pressure has to be conserved to the advantage of the consumers, then some of the pipe lines should be enlarged or duplicated. This, however, is a question which will involve a careful examination of the records of pressure and consumption in various parts of the system, and we have not had instructions, time, or opportunity to do this.

The physical depreciation has been observed at the numerous exposures and our records are given in the inventory. We have applied the efficiency figures to the respective amounts. The aggregate of these amounts represents the efficiency of the transmission lines, and the difference of \$762,644.23, or an average of 26.2 per cent., is the gross physical depreciation, assuming that new material was used throughout.

The accrued retirement reserve, or amortization, less a residual value of 25 per cent. of the reproduction cost new, is proportionate to the time which has elapsed since construction to the life of the gas field from its inception. As has been explained in the parts referring to leaseholds, we estimated that the supply of gas will last for about 12 years from the present time. The average year in which the transmission lines were laid is about 1914. Consequently the period for retirement is 21 years. On the straight line basis the accrued retirement reserve for 9 years out of the gross 21 years is \$936,350; on the sinking fund basis, at five per cent., the accrued retirement reserve for the same time would be \$550,485.

TRANSMISSION LINES INVENTORY

Sheet No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
WINDSOR—MAIDSTONE—MIDDLE ROAD										
1.....	10	N	D.C.	1909	.....	1.18	301	\$14,176.80	\$16,728.62	80
	10	"	"	"	.....	1.50	302	"	21,265.20	80
	10	"	"	"	.....	2.20	303	"	31,188.96	80
	10	"	"	"	.....	1.86	304	"	26,368.85	80
	10	"	"	"	.....	2.70	305	"	38,277.36	80
	10	"	"	"	.....	0.85	306	"	12,050.28	80
	10	"	"	"	.....	2.70	307	"	38,277.36	80
	10	"	"	"	.....	2.20	308	"	31,188.96	80
	10	"	"	"	.....	2.30	309	"	32,606.64	70
	10	"	"	"	.....	2.82	309	"	39,978.58	70
Total, 10 in.....						20.31			\$287,930.81	.....

WINDSOR OLD LINE

4.....	8	S.H.	S	1909	.....	2.10	310	\$9,980.00	\$20,958.00	70
6.....	8	"	"	"	.....	2.25	311	"	22,455.00	80
	8	"	D.C. welded	"	1921	1.00	.....	10,560.00	10,560.00	.....
	8	"	S	"	.....	2.30	312	9,980.00	22,954.00	55
	8	"	"	"	.....	1.15	.....	"	11,477.00	.....
	8	"	"	"	.....	2.75	313	10,560.00	29,040.00	60
	8	"	D.C. welded	"	1921	2.45	134	"	25,872.00	90
	8	"	S	"	.....	3.00	132	9,980.00	29,940.00	30
	8	"	"	"	.....	0.55	.....	"	5,489.00	.....
	8	"	D.C. welded	"	1922	1.00	132	10,560.00	10,560.00	30
	8	"	S	"	.....	0.80	152	9,980.00	7,984.00	80
Total, 8 in.....						19.35			\$197,289.00	.....

10	"	D.C.	"	1.00	153	\$14,176.80	\$14,176.80	80
10	"	"	"	0.35		"	4,961.88	
				1.35			\$19,138.68	
11		D.C.	1914	1.50	157	\$20,143.20	\$30,214.80	
							\$246,642.48	
Grand Total.....								

WINDSOR NEW LINE

4	8	N	D.C.	1914	2.10	310	\$22,176.00	80
6	8	"	"	"	2.25	311	23,760.00	80
	8	"	"	"	3.30	312	34,848.00	85
	8	"	"	"	1.15		12,144.00	
	8	"	"	"	2.75	313	29,040.00	80
11	8	"	"	"	2.30	133	24,288.00	70
	8	"	"	"	3.00	132	31,680.00	60
	8	"	"	"	2.80	150	29,568.00	70
	8	"	"	"	1.77	150	18,691.20	70
					21.42		\$226,195.20	
Total, 8 in.....								

WALKER ROAD

1	4 1/4 4 7/8	S.H.	D.C.	1921	2.60	314	\$3,643.20	70
		"	"	"	0.25		4,118.40	
Total.....								
							\$10,501.92	

MAIDSTONE PORTION

1	2	N	S	1910	1.20		\$1,769.00	
Total.....								
							\$2,122.80	

TRANSMISSION LINES INVENTORY—Continued

Sheet No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
TECUMSEH ROAD										
1.....	5 $\frac{5}{8}$	S.H.	S	1910	1912	2.06	.....	\$5,438.40	\$11,203.10	.....
	5 $\frac{5}{8}$	"	"	"	"	1.93	317	"	10,496.10	80
	5 $\frac{5}{8}$	"	"	"	"	1.57	316	"	8,538.29	60
Total, 5 $\frac{5}{8}$ in.....						5.56	.....	.....	\$30,237.49	.....
ESSEX LINE										
4.....	3	N	S	1909	.....	2.95	317	\$3,036.00	\$8,956.20	80
BELLE RIVER										
4.....	3	S.H.	S	1910	.....	5.25	318 (S)	\$2,920.00	\$15,330.00	90
	2	"	"	"	"	300 ft.	.....	.31 $\frac{1}{2}$	94.50	.....
Total.....						.....	.....	.....	\$15,424.50	.....
ST. JOACHIM										
4.....	2	S.H.	S	1912	.....	4.58	(S)	\$1,669.00	\$7,644.02	.....
	2	"	"	"	"	500 ft.	(S)	.31 $\frac{1}{2}$	157.50	.....
Total.....						.....	.....	.....	\$7,801.52	.....

DEERBROOK

	2	S.H.	S	1912	Partly rep. 1922	0.75	319 (S)	\$1,669.00	\$1,251.75	70
4.....										

SOUTH WOODSLEE

	2	N	S	1909	1.00	(S)	\$1,669.00	\$1,669.00
4.....										

COMBER

	3	N	S	1909	.....	1.80 157 ft.	.....	\$3,036.00 .57 1/2	\$5,464.80 79.17	.....
6.....										
From regulator to street.....	3									
Total.....									\$5,543.97	.....

TILBURY TOWN LINE—JEANNETTE CREEK AND PUMPS—FOULDS

	3	N	S	1912	.....	5.70	148	\$3,036.00	\$17,305.20	30
11.....									4,554.00	.....
10.....	3	"	"	"		1.50		"	3,043.20	.....
10.....	3	"	"	"		1.20		"	9,563.40	.....
10.....	3	"	"	"		3.15		"	1,518.00	50
10.....	3	"	"	"		0.50	320	"		.....
10. No. 3 pump.....	3	"	"	1913		0.035		"	106.26	.....
10. No. 2 pump.....	3	"	"	"		0.027		"	81.97	20
10. No. 2 pump.....	3	"	"	"		0.23		"	698.28	80
Total, 3 in.....						12.342			\$37,470.31	.....
10. Foulds	2	N	S	1913		0.70		\$1,769.00	\$1,238.30	.....
10.....	2 1/2	S.H.	"	1915		0.90		2,270.00	2,043.00	.....
10.....	1 1/4	"	"	"		300 ft.		.18 1/2	55.50	.....
Grand total.....									\$40,807.11	.....

TRANSMISSION LINES INVENTORY—Continued

Sheet No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
VALETTA										
11.....	4	N	D.C.	1914	.....	1.10	147	\$4,646.40	\$5,111.04	70
	4	"	"	"	.....	2.80	147	"	13,009.92	70
	4	"	"	"	.....	1.65	146	"	7,666.56	70
	4	"	"	"	.....	0.40	145	"	1,858.56	50
Total, 4 in.....						5.95	.....		
	3	"	Sc.	1916	.....	0.40	.....	3,036.00	1,214.40	
Grand Total.....							.....		\$28,860.48	
CHATHAM ORIFICE METER CONNECTION										
11.....	8	N	Sc.	1912-14	.....	58 ft.	.....	\$1.89	\$109.62	
STEVENSON ORIFICE METER CONNECTION										
11.....	8	S.H.	D.C.	1912-14	.....	131 ft.	.....	\$2.00	\$262.00	
SARNIA LINE										
11.....	10	N	D.C.	1916	.....	2.00	156	\$14,176.80	\$28,353.60	75
	10	"	"	"	.....	2.00	130}	"	28,353.60	90
	10	"	"	"	.....	2.45	144	"	34,733.16	80
	10	"	"	"	.....	2.90	143	"	41,112.72	.....
	10	"	"	"	.....	3.30	.....	"	46,783.44	90
							138			
	10	"	"	"	.....	2.60	1	"	36,859.68	90
	10	"	"	"	.....	0.45	3	"	6,379.56	80
	10	"	"	"	.....	3.40	6	"	48,201.12	90

8.	10 10	" "	" "	" "	.....	2.25 0.90	11 12	" "	31,897.80 12,759.12	90 90
21.	10 10 10 10 10 10	" " " " " "	" " " " " "	" " " " " "	.....	2.30 4.95 1.70 1.70 1.70	13 24 25 26 27	" " " " "	32,606.64 70,175.16 24,100.56 24,100.56 24,100.56	90 90 90 90 90
20.	10 10	" "	" "	" "	.....	4.00 3.05	33 34	" "	56,707.20 43,239.24	90 90
Total, 10 in.						41.65			\$590,463.72	.....
20.	12 12 12 12	N " " "	D.C. " " "	1912 " " "	.....	0.75 1.70 1.45 1.70	35 36 38 101	\$20,143.20 " " "	\$15,107.40 34,243.44 29,207.64 34,243.44	70 40 20 30
Total, 12 in.						5.60			\$112,801.92	.....
9.	8	"	"	1909	1915	2.75	9	\$10,560.00	\$29,040.00	90
20.	8		Sc.			0.30	49	9,980.00	2,994.00	80
19.	8	S.H. "		1909		5.80	104	"	61,248.00	60
20. To regulator.	8		D.C.		1921	0.19		10,560.00	2,006.40	.....
Total, 8 in.						219 ft.		1.89	413.91	.....
Grand total.									\$95,702.31	.....
									\$798,967.95	.....

SARNIA BYPASS

20.	8	S.H.	D.C. welded	1918	.....	3.40	47 46	\$10,560.00	\$35,904.00	85
19.	8 8 8	" " "	" " "	" " "	.....	2.25 2.35 0.25	105 105 107	" " "	23,760.00 24,816.00 2,640.00	90 90 60
Total, 8 in.						8.25			\$87,120.00	.....

TRANSMISSION LINES INVENTORY—Continued

Sheet No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
NORTHERN LINE										
11.....	6	S.H.	S	.....	1912	2.30	151	\$7,445.00	\$17,123.50	60
	6	"	"	.....	"	1.00	.....	"	7,445.00	.....
	6	"	"	1909	.....	2.50	131	"	18,612.50	60
	6	"	"	"	.....	1.20	129	"	8,934.00	70
	6	"	"	"	.....	2.10	128	"	15,634.00	70
10.....	6	"	"	"	.....	2.60	127	"	19,357.00	70
	6	"	"	"	.....	2.70	124	"	20,101.50	50
	6	"	"	"	.....	2.25	2	"	16,751.25	70
	6	"	"	"	.....	1.70	4	"	12,656.50	80
	6	"	"	"	.....	2.10	6	"	15,634.50	20
Total, 6 in.....						20.45	.....	.....	\$152,250.00	.....
9.....	8	"	"	"	.....	3.00	7	\$9,980.00	\$29,940.00	70
	8	"	"	"	.....	1.60	10	"	15,968.00	80
	8	"	"	"	.....	2.60	22	"	25,948.00	70
	8	"	"	"	.....	2.40	14	"	23,952.00	70
Total, 8 in.....						9.60	.....	.....	\$95,808.00	.....
Grand total.....							.....	.....	\$248,058.25	.....
CHATHAM LINE										
11.....	8	S.H.	S	1914	.....	0.55	149	\$9,980.00	\$5,489.00	80
	8	"	D.C. welded	1923	.....	0.80	.....	10,560.00	8,448.00	80
	8	N	D.C.	1914	.....	1.78	.....	"	18,796.80	80
	8	"	"	"	.....	1.10	135	"	11,616.00	.....
	8	"	"	"	.....	1.00	136	"	10,560.00	80

TRANSMISSION LINES INVENTORY—Continued

Sheet No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
HIGHGATE										
17.....	4 1/4	S.H.	D.C.	1915	.....	1.30	54	\$3,643.20	\$4,736.16	90
	4 1/4	"	"	"	.....	2.30	50	"	8,379.36	80
	4 1/4	"	"	"	.....	1.10	51	"	4,007.52	80
	4 1/4	"	"	"	.....	1.10	52	"	4,007.52	80
Total, 4 1/4 in.....						5.80	.....	.....	\$21,130.56	.....
17.....	3	"	Sc.	1909	.....	0.40	52	\$3,036.00	\$1,214.40	20
17.....	2	"	"	"	.....	0.05	52	1,769.00	88.45	70
Grand total.....						.....	.....	.....	\$22,433.41	.....
PALMYRA										
17.....	2	S.H.	Sc.	.....	1922	2.40	67	\$1,769.00	\$4,245.60	.....
WALLACEBURG—BYPASS, ETC.										
8. Bypass.....	6	S.H.	Sc.	1912	.....	1.65	23	\$7,445.00	\$12,284.25	70
8. Old, regulator union.....	8	"	"	1910	.....	142 ft.	.....	\$1.89	\$268.38	70
Gas Company.....	8	"	"	"	.....	142 ft.	.....	"	268.38	70
Sugar Company.....	8	"	"	"	.....	142 ft.	.....	"	268.38	70
Glass Company.....	8	"	"	"	.....	130 ft.	.....	"	245.70	70
Total, 8 in.....						556 ft.	.....	.....	\$1,050.84	.....
Grand total.....						.....	.....	.....	\$13,335.09	.....

TUPPERVILLE—DRESDEN

8.....	4 1/4	S.H. "	D.C. "	1910 "	.....	4.40	18	\$3,643.20	\$16,030.08	90
12.....	4 1/4	"	"	"	.....	2.65	20	"	9,654.48	90
	4 1/4	"	"	"	.....	3.20	21	"	11,658.24	90
Total, 4 1/4 in.....						10.25	.....	.....	\$37,342.80	.....

WALLACEBURG

8. Tileyard, on Sydenham river	2	S.H.	Sc.	1911	.....	1,800 ft.	.....	\$0.33 1/2	\$603.00	.....
Pump to street.....	2	"	"	"	.....	2,210 ft.	.....	"	70.35	.....
To pump-house.....	2	"	"	"	.....	2,100 ft.	.....	"	703.50	.....
Total, 2 in.....						4,110 ft.	.....	.....	\$1,376.85	.....

PETROLIA

20.....	6	N	D.C.	1914	.....	1.05	102	\$7,946.40	\$8,343.72	80
	6	"	"	"	.....	2.15	103	"	17,084.76	60
	6	"	"	"	.....	0.90	.....	"	7,151.76	.....
23.....	6	"	"	"	.....	1.45	109	"	11,522.28	70
	6	"	"	"	.....	1.05	.....	"	8,343.72	.....
	6	"	"	"	.....	2.25	110	"	17,879.40	70
	6	"	"	"	.....	0.375	321	"	2,979.90	80
Total, 6 in.....						9.225	.....	.....	\$73,305.54	.....

EDDY MILLS

23.....	6	N	D.C.	1914	.....	3.30	116	\$7,946.40	\$26,223.12	60
	6	"	"	"	.....	1.85	117	"	14,700.84	80
	6	"	"	"	.....	1.95	118	"	15,495.48	80
	6	"	"	"	.....	1.75	.....	"	13,906.20	.....
	6	"	"	"	.....	1.30	119	"	10,330.32	80
Total, 6 in.....						10.15	.....	.....	\$80,655.96	.....

TRANSMISSION LINES INVENTORY—Continued

Sheet No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
EDDY MILLS—Continued										
23.....	4	S.H.	S	1922	.....	2.10	119	\$4,250.40	\$8,925.84	80
24.....	4	"	D.C. welded	"	.....	0.85	120	4,646.40	3,949.44	60
	4	"	S. welded	"	.....	0.85	.....	"	3,949.44	.....
	4	"	"	"	.....	1.85	322	"	8,595.84	60
Total, 4 in.....						5.65	.....	.....	\$25,420.50	.....
23. Bypass.....	1					165 ft.	.....	\$0.15 1/2	\$25.57	.....
Grand total.....							.....	.....	\$106,102.03	.....
MOORETOWN AND COURTRIGHT										
20.....	4	N	D.C.	1914	.....	5.60	39\	\$4,646.40	\$26,019.84	90
	4	"	"	"	.....	1.63	40\	"	7,573.63	70
Total, 4 in.....						7.23	43	.....	\$33,593.47	.....
CORUNNA—RIVER ROAD										
20. R.R.....	2	S.H.	S	1914	.....	3.75	41\	\$1,769.00	\$6,633.75	60
	2	"	"	"	.....	1.40	42\	"	2,476.60	.....
	2	"	"	1920	.....	1.90	44	"	3,361.10	60
Total.....							.....	.....	\$12,471.45	.....

TRANSMISSION LINES INVENTORY—Continued

Sheet No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
PAINCOURT										
10.....	2	S.H.	Sc.	1910	.....	0.77	.....	\$1,769.00	\$1,362.13	.....
DOVER—CONCESSIONS IV AND V										
10.....	4	N	Sc.	1918	.....	4.50	4	\$4,250.40	\$19,126.80	.....
	3	S.H.	"	1917	.....	4.50	4	3,036.00	13,662.00	.....
	2	"	"	1918	.....	4.50	4	1,769.00	7,960.50	.....
Total.....								.....	\$40,749.30	.....
BLENHEIM										
14.....	4 1/4	S.H.	D.C.	1912-14	.....	0.55	82	\$3,643.20	\$2,003.65	.....
	4 1/4	"	"	"	.....	0.85	82	"	3,096.55	.....
Total.....								.....	\$5,100.20	.....
FLETCHER										
Regulator to street.....	2	N	.....	1909	.....	40 ft.	.....	\$0.33 1/2	\$13.40	.....

FITTINGS ON TOWN LINE OPPOSITE DOVER METER HOUSE

Quantity	Item	Unit cost	Reproduction cost new
2	8 in. elbows welded.....	\$15.00	\$30.00
1	8 in. x 4 in. swedge nipple.....		6.37
1	4 in. heavy cast tee.....		4.45
1	4 in. heavy cast ell.....		2.68
1	3 in. heavy cast tee.....		2.43
2	3 in. heavy cast ells.....	1.53	3.06
2	4 in. x 3 in. swedge nipples.....	1.57	3.14
2	3 in. high pressure gate valves.....	22.60	45.20
7	3 in. nipples.....	.43	3.01
1	4 in. high pressure gate valve.....		27.80
1	3 in. flange union.....		1.82
2	4 in. flange unions.....	2.55	5.10
	Labour, team and miscellaneous.....		20.25
	Total.....		\$155.31

Old Transmission Lines in Ground

For some reason about $8\frac{1}{2}$ miles of 8-inch pipe on the Sarnia line, laid, we believe, in 1909, but replaced by other pipes in 1916, were left in the ground. We are asked to include them in the inventory, but we prefer to mention them separately for the decision of the Board of Reference. As the pipes are not in use, we can only regard them as material in stock. These pipes now cost about \$1.50 per foot run, but in 1909 the cost was about 80 cents. They must now be only partially useful; probably less than one-half of them, or about 4 miles, can be used on low pressure lines. Fifty per cent. of the 1923 value would probably be a fair appraisal for these pipes when taken out and put into stock, that is \$15,840.

DISTRIBUTION LINES

The summary of the inventory of distribution pipe lines, together with the inventory itself, follows.

DISTRIBUTION MAINS—SUMMARY

Page		Reproduction cost new
98	Belle River.....	\$10,141.74
99	Blenheim.....	28,426.38
102	Brigden.....	8,576.90
103	Cedar Springs.....	3,246.52
103	Chatham—Northwood subdivision.....	3,588.23
104	Comber.....	9,002.62
105	Copleston.....	1,168.32
105	Corunna.....	6,615.22
106	Courtright.....	8,620.22
107	Deerbrook.....	2,100.40
107	Dresden.....	29,407.45
111	Essex.....	21,345.15
113	Fletcher.....	1,720.26
113	Froomfield.....	1,975.22
113	Maidstone.....	843.95

DISTRIBUTION MAINS—*Continued*

Page		Reproduction cost new
114	Merlin	
115	Mooretown	\$9,532.33
115	Morpeth	2,552.63
116	North Woodslee	3,919.81
117	Paincourt	926.88
		5,272.60
117	Port Alma	
117	Port Lambton	713.62
118	Ridgetown	3,659.46
121	Rondeau	39,863.35
121	Ruscomb	131.30
		340.00
122	St. Joachim	1,627.66
122	Shrewsbury Town	1,724.14
123	Sombra	7,058.96
123	South Woodslee	2,100.19
124	Tecumseh	9,857.82
125	Tilbury	
127	Tupperville	21,738.23
128	Wilkesport	1,454.25
128	Armstrong and Coffee	1,541.35
128	Haskell and Reigner	4.50
		13.50
128	Johnson Miffin	556.14
128	Fur line	213.90
129	McCaul line	151.50
129	Glenwood	1,791.40
129	Bradley	2,704.00
129	River road—Thames	15,406.20
129	Prairie Siding	530.64
130	Raleigh—Concession III	641.70
130	Dover town line	1,148.40
130	Dover—Concessions III and IV	998.20
130	Dover—4th Line	1,494.60
131	Dover No. 4, Northern	794.78
131	Dover No. 3, Northern	570.40
131	Dover No. 1, Union	1,076.00
131	Dover—Concessions VIII and IX	855.60
131	Charing Cross	17,898.00
131	Rhodes	1,932.48
132	Raleigh—Concession IX	4,104.00
132	Raleigh—Concession VIII	25.50
132	Raleigh—Concession VII	12.60
132	Raleigh—Middle road	15.75
132	High Banks	427.80
133	Taylor	285.20
133	Shrewsbury vicinity	5,723.52
133	Blenheim vicinity	1,795.20
133	Rondeau Harbour	4,308.48
133	Shrewsbury to New Scotland	8,257.92
134	Rondeau road	2,244.00
134	East of New Scotland	792.00
134	New Scotland to Lake	4,397.08
134	Lacreek	1,243.44
135	Raglan line	805.70
135	Indian Creek, east of Giles	283.50
	Total	\$334,926.79

Unit Cost

The unit costs include labour, team, and pipes; 8 per cent. of the cost of the pipes provide for fittings and miscellaneous and unavoidable waste; while 5 per cent. on the total covers contingencies. Duty of 30 per cent., with the rebate of one-half in the case of 4-inch to 10-inch pipes, has not been considered, because we have adopted Canadian prices which are fairly close to those of the imported pipes.

Original Cost

Probably the most reliable way of arriving at an estimate of the actual cost of the distribution pipes, is to regard all lines laid prior to 1915 as having been constructed when the index cost number was 100, and to apply the respective index numbers to the work which was carried out in the subsequent years.

Applying the different methods as described in connection with the transmission pipe lines, we arrive at the following estimates of the original cost.

Based upon the "Engineering News-Record" construction cost index numbers and a standard of 100 for 1914 and previous years, we find as follows:—

Total cost of distribution lines.....	\$334,297
Work done in 1915 to 1923.....	67,035
Work done in 1914 and earlier.....	\$267,262

$$\$267,262 \times \frac{100}{220} = \$121,500$$

$$\$67,035 \times \frac{149.2}{220} = \$45,600$$

Probable original cost = \$167,100

Based upon the Canadian steel pipe index numbers, we find:—

$$\$267,262 \times \frac{100}{192.5} = \$138,840$$

$$\$67,035 \times \frac{180.9}{192.5} = \$63,010$$

Probable original cost = \$201,850

Based upon composite index numbers for Canadian steel pipe and Canadian labour, we have:—

1914 AND EARLIER

Materials.....	\$213,812	
Labour.....	53,450	
		<hr/> \$267,262

1915 AND LATER

Materials.....	\$53,628	
Labour.....	13,407	
		<hr/> \$67,035
Total.....		<hr/> \$334,297

The probable original cost on this basis will, therefore, be:—

$\$213,812 \times \frac{100}{192.5} =$	$\$111,100$	
$\$53,450 \times \frac{100}{150} =$	$\$29,700$	$\$140,800$
$\$53,628 \times \frac{180.9}{192.5} =$	$\$50,400$	
$\$13,407 \times \frac{140.2}{180} =$	$\$10,450$	$\$60,850$
Total.....		$\$201,650$

SUMMARY

By "Engineering News-Record" index numbers.....	\$167,100
By Canadian steel pipe index numbers.....	\$201,850
By composite pipe and labour index numbers.....	\$201,650

These costs are based upon the assumption that new material was used throughout.

Depreciation—Distribution Pipe Line

The general condition of the distribution lines is fairly good, so far as normal operating efficiency is concerned. The only expenditure we could suggest would be for the enlargement of some of the principal lines to compensate for the drop in pressure, especially during periods of heavy consumption. We are not in a position to advise what could be done with advantage, because this would entail a study which is not a part of our instructions.

The physical depreciation of the pipe lines has been carefully observed, and the record of the result is given in the inventory. We have ascertained the average condition and have applied such percentage to the lines in each town. The physical depreciation found in this manner is about \$70,678.42, which is an average of about 21 per cent.

This is based upon the assumption that new material was used throughout.

The accrued retirement reserve, less a residual value of 25 per cent. of the reproduction cost new, is based upon the principle that it is proportionate to the number of years the distribution lines have been in service compared with the total life time of the gas fields from their inception. We have estimated that the gas fields will probably be exhausted by 1935, but this life may, of course, be extended by judicious exploration. The average period which has elapsed since the construction of the distribution lines is about eleven years, and we estimate that the life of the gas fields is 12 years from the present time, so that the accrued retirement reserve, less the residual value as above, on the straight line basis will be \$119,900, or on the sinking fund basis, \$66,612.

A complete inventory of the distribution mains follows, in which has been recorded all the data we have obtained with reference to these lines.

DISTRIBUTION MAINS INVENTORY

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
BELLE RIVER									
Railway Ave.....	U	3	N	1911	.....	650	\$0.59	\$383.50	80
First.....	"	3	"	"	.....	722	.59	425.98	80
Second.....	"	2	"	"	.....	200	.34	68.00	.....
Third.....	"	1	"	"	.....	130	.15	19.50	.....
.....		2			.....	429	.34	145.86	.....
Church.....	"	2	"	"	.....	570	.34	193.80	.....
".....	"	6	"	"	.....	380	1.44	646.20	70
Broadway.....	"	2	"	"	.....	1,910	.34	649.40	80
".....	"	2	"	"	.....	380	.34	129.20	.....
Seventh.....	"	1	"	"	.....	50	.15	7.50	.....
.....		2			.....	480	.34	163.20	.....
Sixth.....	P	2	"	"	.....	186	.34	63.24	.....
Main.....	"	1	.....	"	.....	300	.15	45.00	.....
".....	"	8	.....	1914	1922	1,614	1.94	3,131.16	70
".....	"	2	S.H.	1922	.....	220	.34	74.80	.....
".....	"	2	part new	"	.....	1,630	.34	554.20	.....
".....	"	2	.....	1911	.....	1,291	.34	438.94	.....
South.....	U	8	.....	1922	.....	320	1.94	620.80	.....
".....	"	2	N	1911	.....	1,480	.34	503.20	80
Centre.....	"	2	"	"	.....	600	.34	204.00	.....
East River.....	"	2	"	"	.....	276	.34	93.84	.....
".....	"	1	"	"	.....	160	.15	24.00	.....
St. Paul.....	"	2	"	"	.....	320	.34	108.80	60
St. Louis.....	"	2	"	"	.....	562	.34	191.08	60
St. John.....	"	2	"	"	.....	210	.34	71.40	.....
St. Lawrence.....	"	2	"	"	.....	60	.34	20.40	.....
".....	"	1	"	"	.....	30	.15	4.50	.....
St. Charles.....	"	1 1/4	"	"	.....	142	.18	25.56	.....

"	"	2	"	"	1,630	.34	554.20	.....
"	"	3	"	"	100	.59	59.00	.....
"	"	2	"	"	1,152	.34	391.68	.....
To and from regulator	"	3	"	"	117	.59	69.03	.....
"	"	3	"	"	103	.59	60.77	.....
Total	.....	.....	.....	.....	.....	.....	\$10,141.74	.....

BLENHEIM

Cathcart	U	3	S.H.	1907	.....	250	\$0.59	\$147.50	.....
Station Rd	"	2	"	"	.....	335	.34	113.90	60
Sherman	"	2	"	"	.....	300	.34	102.00	.....
"	"	1	"	"	.....	360	.15	54.00	.....
"	"	1 1/4	"	"	.....	45	.18	8.10	.....
Anger	"	2	"	"	.....	740 \	.34	251.60	.....
"	"	3	"	"	.....	310	.59	182.90	.....
Maxwell	"	2	"	"	.....	512	.34	174.08	.....
Hannibal	"	2	"	"	.....	1,020	.34	346.80	90
McGregor	"	3	"	"	.....	1,220	.59	719.80	.....
Church	"	2	"	"	.....	142	.34	48.28	.....
"	"	1	"	"	.....	110	.15	16.50	.....
"	"	2	"	"	.....	85	.34	28.90	.....
Reserve	"	2	"	"	.....	245	.34	83.30	.....
Ellen	"	2	"	"	.....	1,180	.34	401.20	60
"	"	2	"	"	.....	300	.34	102.00	.....
"	"	4	"	"	.....	325	.82	266.50	.....
Talbot Rd	P	2	"	"	.....	1,965	.34	668.10	.....
"	"	3	"	"	.....	295	.59	174.05	.....
"	"	3	"	1921	.....	1,410	.59	831.90	.....
"	"	3	"	1908	.....	615	.59	362.85	.....
"	"	3	"	1921	.....	1,730	.59	1,020.70	.....
"	"	3	"	1908	1921	330	.59	194.70	.....
"	"	2	"	"	.....	870	.34	295.80	.....
"	"	2	"	"	.....	1,000	.34	340.00	.....
"	"	3	"	"	.....	1,045	.59	616.55	.....
"	"	3	"	"	.....	1,455	.59	858.45	70

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
BLENHEIM—Continued									
Talbot Rd.	P	8	S.H.	1908	.....	1,015	\$1.94	\$1,969.10	.....
"	"	8	"	"	.....	1,625	1.94	3,152.50	.....
"	"	2	"	1910	.....	1,200	.34	408.00	.....
"	"	2	"	"	.....	43	.34	14.62	.....
"	"	3	"	"	.....	45	.59	26.55	.....
"	"	3	"	"	.....	35	.59	20.65	.....
Catherine.	U	2	"	"	.....	625	.34	212.50	.....
"	"	1 1/4	"	"	.....	278	.18	50.04	.....
"	"	3	"	"	.....	450	.59	265.50	.....
"	"	2	"	"	.....	250	.34	85.00	.....
Jane.	"	2	"	"	.....	200	.34	68.00	.....
"	"	1 1/4	"	"	.....	194	.18	34.92	.....
"	"	2	"	"	.....	600	.34	204.00	.....
"	"	2	"	"	.....	600	.34	204.00	.....
Wellington.	"	2	"	"	.....	400	.34	136.00	.....
John.	"	3	"	"	.....	1,525	.59	899.75	70
"	"	2	"	"	.....	500	.34	170.00	.....
"	"	2	"	"	.....	320	.34	108.80	.....
"	"	2	"	"	.....	970	.34	329.80	70
Stanley.	"	1 1/4	"	"	.....	400	.18	72.00	.....
Regent.	"	2	"	"	.....	1,620	.34	550.80	80
Charles.	"	2	"	"	.....	475	.34	161.50	.....
"	"	1	"	"	.....	125	.15	18.75	.....
End of McGeorge.	"	2	"	"	.....	490	.34	166.60	.....
"	"	1 1/4	"	"	.....	200	.18	36.00	.....
Margaret.	"	1 1/4	"	"	.....	445	.18	80.10	.....
Mountford	"	1 1/4	"	"	.....	145	.18	26.10	.....
"	"	2	"	"	.....	100	.34	34.00	.....

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
White.....	U	2	S.H.	1910	.....	370	\$0.34	\$125.80	.....
John.....	"	2	"	"	.....	230	.34	78.20	.....
Total.....	.....	.....	.....	.....	.....	.....	.....	\$28,426.38	.....

BLENHEIM—Continued

BRIDGES

Mill.....	U	2	.....	1910	.....	315	\$0.34	\$107.10	80
".....	"	2	.....	"	.....	740	.34	251.60	.....
First.....	"	6	.....	"	.....	340	1.44	489.60	.....
".....	"	4	.....	"	.....	200	.82	164.00	.....
".....	"	2	.....	"	.....	200	.59	118.00	.....
Second.....	"	1	.....	"	.....	160	.15	24.00	.....
Main.....	"	2	.....	"	.....	500	.34	170.00	90
".....	"	3	.....	"	.....	1,700	.59	1,003.00	80
".....	"	3	.....	"	.....	100	.59	59.00	.....
".....	"	3	.....	"	.....	168	.59	99.12	90
".....	"	1	.....	"	.....	150	.15	22.50	.....
".....	"	6 1/4	.....	"	.....	860	1.21	1,040.60	80
Duncan.....	"	2	.....	"	.....	270	.34	91.80	.....
".....	"	1 1/4	.....	"	.....	200	.18	36.00	.....
".....	"	2	.....	"	.....	340	.34	115.60	.....
".....	"	2	.....	"	.....	225	.34	76.50	.....
".....	"	2	.....	"	.....	227	.34	77.18	.....
No name.....	"	2	.....	"	.....	500	.34	170.00	80
Sydenham.....	"	2	.....	"	.....	800	.34	272.00	.....
".....	"	6	.....	"	.....	1,180	1.44	1,798.20	.....
Jane.....	"	6	.....	"	.....	.....	.....	.....	.....

"	"	"	3	"	"	1,180	.59	696.20	80
"	"	"	2	"	"	825	.34	280.50	80
Boswell	"	"	2	"	"	1,180	.34	401.20	
"	"	"	2	"	"	1,250	.34	425.00	70
Concession Rd.	"	"	2	"	"	770	.34	261.80	
"	"	"	2	"	"	480	.34	163.20	
No name	"	"	2	"	"	480	.34	163.20	90
Total								\$8,576.90	

CEDAR SPRINGS

Ridge Rd.	U	2	1910	1,635	\$0.34	\$555.90	
"	"	2	"	300	.34	102.00	
Town line	"	1 1/4	"	1,300	.18	234.00	
"	"	2	"	1,000	.34	340.00	
"	"	2	"	300	.34	102.00	80
"	"	3	1921	1,200	.59	708.00	90
"	"	2	1910	1,730	.34	588.20	
Tyrrell Ave.	"	2	"	190	.34	64.60	80
Chester Ave.	"	2	"	223	.34	75.82	
Talbot Rd.	"	2	"	1,400	.34	476.00	
Total						\$3,246.52	

CHATHAM—NORTHWOOD SUBDIVISION

Park Ave.	U	1	1913	225	\$0.15	\$33.75	80
"	"	2	"	204	.34	69.36	80
"	"	1	"	52	.15	7.80	
"	"	4	"	849	.82	696.18	60
"	"	1	"	140	.15	21.00	
Berry	"	2	"	1,210	.34	411.40	
O'Neill	"	2	"	1,203	.34	409.02	
Houston	"	2	"	1,203	.34	409.02	
"	"	4	"	170	.82	139.40	80
Kendall	"	2	"	1,203	.34	409.02	

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
CHATHAM—NORTHWOOD SUBDIVISION—Continued									
End of Berry.....	U	2		1913		847	\$0.34	\$287.98	70
Queen St. S.....	"	2		"		1,825	.34	620.50	
Tessman Ave.....	"	1		"		492	.15	73.80	
Total.....								\$3,588.23	
COMBER									
Ainslee Ave.....	U	1 1/4		1912		180	\$0.18	\$32.40	
James.....	"	1 1/4		"		370	.18	66.60	
Taylor Ave.....	"	2		"		220	.34	74.80	
"	"	2		"		360	.34	122.40	90
"	"	3		"		820	.59	483.80	
"	"	2		"		60	.34	20.40	
Middle Rd.....	"	2		"		1,120	.34	380.80	
"	"	2		"		170	.34	57.80	
"	"	2		"		640	.34	217.60	
Main.....	P	2		"		910	.34	309.40	75
"	"	8		1917	1919	1,800	1.94	3,492.00	60
"	U	2		"		600	.34	204.00	
"	P	3		"	1919	1,260	.59	743.40	90
"	U	3		1919		1,170	.59	690.30	90
Abbott Ave.....	U	1		"		130	.15	19.50	
Race course.....	"	2		1910		570	.34	193.80	
Off Ford.....	"	3		"		130	.59	76.70	
Taylor.....	"	2		"		250	.34	85.00	
Maple.....	"	2		"		310	.34	105.40	
William.....	"	3		"		360	.59	212.40	70

"	"	2	"	"	230	.34	78.20	.....
"	"	1	"	"	220	.15	33.00	.....
McAlister,	"	2	1912	"	410	.34	139.40	90
James	"	2	"	"	430	.34	146.20	80
Off Main	"	2	"	"	300	.34	102.00	.....
Off Ford	"	2	S.H.	"	830	.34	282.20	70
"	"	1 1/4	1912	"	80	.18	14.40	70
Regulator to street	"	8	"	"	198	1.94	384.12	.....
Maple	"	2	1923	"	490	.34	166.60	.....
Wallace	"	2	"	"	200	.34	68.00	.....
Total	.....	.....	.....	.....	.....	.....	\$9,002.62	.....

COPLESTON

Main Rd.	U	2	S.H.	1914	1,500	\$0.34	\$510.00	60
"	"	2	"	"	960	.34	326.40	.....
"	"	1 1/4	"	"	195	.18	35.10	70
Total	.....	2	"	"	873	.34	296.82	.....
	.....	.....	.....	.....	.....	.....	\$1,168.32	.....

CORUNNA

Beresford	U	2	.....	1911	1,480	\$0.34	\$503.20	.....
"	"	2	.....	"	920	.34	312.80	.....
"	"	1	.....	"	190	.15	28.50	.....
Lindoch	"	2	.....	"	780	.34	265.20	.....
"	"	4 1/4	.....	1914	740	.60	444.00	.....
"	"	2	.....	"	840	.34	285.60	.....
"	"	4 1/4	.....	"	700	.60	420.00	60
"	"	2	.....	1911	700	.34	238.00	.....
"	"	2	.....	"	700	.34	238.00	.....
Murray	"	2	.....	"	560	.34	190.40	90
"	"	2	.....	"	920	.34	312.80	90
"	"	4 1/4	.....	1914	70	.60	42.00	.....
"	"	2	.....	1911	320	.34	108.80	.....

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
CORUNNA—Continued									
Padget.....	U	2	.....	1911	.....	380	\$0.34	\$129.20	.....
"	"	2	.....	"	.....	750	.34	255.00	90
"	"	2	.....	"	.....	450	.34	153.00	.....
Hill.....	"	1	.....	"	.....	220	.15	33.00	.....
"	"	2	.....	"	.....	690	.34	234.60	.....
"	"	4 1/4	.....	1914	.....	740	.60	444.00	.....
"	"	4 1/4	.....	"	.....	520	.60	312.00	70
Fane.....	"	2	.....	1911	.....	420	.34	142.80	10
"	"	1	.....	"	.....	220	.15	33.00	90
"	"	2	.....	"	.....	340	.34	115.60	.....
Through block	"	2	.....	"	.....	380	.34	129.20	.....
Lindoch.....	"	4 1/4	.....	1914	.....	60	.60	36.00	.....
"	"	2	.....	"	.....	60	.34	20.40	.....
Loop.....	"	2	.....	1911	.....	1,428	.34	485.52	.....
On hill.....	"	2	.....	"	.....	1,340	.34	455.60	.....
Parker line.....	"	2	.....	1920	.....	700	.34	238.00	.....
"	"	1	.....	"	.....	60	.15	9.00	.....
Total.....	.....	.....	.....	.....	.....	.....	.....	\$6,615.22	.....

COURTRIGHT

Second.....	U	2	.....	1914	.....	395	\$0.34	\$134.30	.....
Railway.....	"	2	.....	"	.....	300	.34	102.00	.....
St. Clair.....	"	5 5/8	.....	"	.....	296	1.06	313.76	80
"	"	5 5/8	.....	"	.....	32	1.06	33.92	80
Front.....	"	5 5/8	.....	"	.....	1,092	1.06	1,157.52	60

River Rd.....	"	3		"	2,088	.59	1,231.92	90
"	"	3		"	280	.59	165.20	
Thompson.....	"	5 $\frac{5}{8}$		"	1,011	1.06	1,071.66	70
"	"	3		"	60	.59	35.40	
"	"	2		"	476	.34	161.84	
Main.....	"	5 $\frac{5}{8}$		"	2,205	1.06	2,337.30	60
"	"	4		"	190	.82	155.80	
Milton.....	"	5 $\frac{5}{8}$		"	1,214	1.06	1,286.84	
"	"	3		"	80	.59	47.20	50
"	"	2		"	350	.34	119.00	
Centre.....	"	2		"	340	.34	115.60	90
"	"	2		"	95	.34	32.30	90
Charlton.....	"	2		"	349	.34	118.66	
Total.....							\$8,620.22	

DEERBROOK—NORTH OF RAILWAY

In town.....	U	1 $\frac{1}{2}$	S.H.	1912	Partly rep. 1922 }	0.90 (S)	\$1,056.00	90
Over river.....	"	1 $\frac{1}{4}$	"	"	"	0.45 (S)	1,000.00	70
		1 $\frac{1}{4}$	"	"	"	0.70 (S)	1,000.00	90
Total.....							\$2,100.40	

(S) Surface

DRESDEN

Walnut.....	U	2		1910		1,072 *	\$0.34	\$364.48	
Davis.....	"	1		"		100	.15	15.00	
"	"	2		"		130	.34	44.20	
"	"	4		"		320	.82	262.40	90
"	"	1 $\frac{1}{4}$		"		360	.18	64.80	
Trerice.....	"	1 $\frac{1}{4}$		"		290	.18	52.20	
"	"	1		"		90	.15	13.50	
"	"	2		"		1,135	.34	385.90	

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
DRESDEN—Continued									
Terlice.....	U	4	.....	1910	.....	640	\$0.82	\$524.80	.....
".....	"	2	.....	"	.....	2,200	.34	748.00	.....
Richmond.....	"	2	.....	"	.....	1,550	.34	527.00	.....
Isaac.....	(pt. pav.)	2	.....	"	.....	630	.34	214.20	80
Camden.....	U	2	.....	"	.....	1,170	.34	397.80	90
".....	"	2	.....	"	.....	1,610	.34	547.40	.....
".....	"	4	.....	"	.....	420	.82	344.40	80
Talbot.....	"	3	.....	"	.....	820	.59	483.80	80
Lindsay.....	"	2	.....	"	.....	970	.34	329.80	.....
".....	"	2	.....	"	.....	500	.34	170.00	.....
Queen.....	"	2	.....	"	.....	275	.34	93.50	.....
".....	"	2	.....	"	.....	710	.34	241.40	.....
".....	"	4	.....	"	.....	300	.82	246.00	60
".....	"	2	.....	"	.....	560	.34	190.40	.....
Brown.....	"	2	.....	"	.....	275	.34	93.50	80
".....	"	3	S.H.	1918	.....	985	.59	581.15	.....
".....	P	3	.....	1910	.....	133	.59	78.47	.....
Main.....	"	4	.....	"	.....	290	.82	237.80	.....
".....	"	2	.....	"	.....	300	.34	102.00	.....
".....	"	2	.....	"	.....	80	.34	27.20	.....
".....	"	1	.....	"	.....	110	.15	16.50	.....
Rear of Main.....	"	2	.....	"	.....	430	.34	146.20	.....
Robinson.....	U	2	.....	"	.....	1,080	.34	367.20	.....
Hughes.....	"	3	.....	"	.....	1,250	.54	737.50	.....
".....	"	4	.....	"	.....	1,045	.82	856.90	.....
Brock.....	"	3	.....	"	.....	1,098	.59	647.82	.....
Sydenham.....	"	3	.....	"	.....	2,075	.59	1,224.25	70

To Meadows.....	"	2	S.H.	"	2,400 (S)	32	768.00	90
Victoria Ave.....	"	2	S.H.	1922	290	.34	98.60	.....
"	"	2	.....	1910	80	.34	27.20	.....
"	"	2	.....	"	600	.34	204.00	.....
Holden.....	P	1	.....	"	60	.15	9.00	.....
"	"	2	.....	"	220	.34	74.80	.....
"	"	4	.....	"	2,300	.82	1,886.00	80
"	"	2	.....	"	1,060	.34	360.40	80
"	"	3	.....	"	90	.59	63.10	.....
"	"	4	.....	"	75	.82	61.50	.....
"	"	4	.....	"	150	.82	123.00	.....
"	"	3	.....	"	90	.59	53.10	.....
Park.....	U	2	S.H.	1922	510	.34	173.40	.....
Metcalf.....	"	2	.....	1910	150	.34	51.00	.....
John.....	"	1	.....	"	60	.15	9.00	.....
"	"	3	.....	"	390	.59	230.10	90
"	"	2	.....	"	400	.34	136.00	90
Fuller.....	"	2	.....	"	650	.34	221.00	70
Paterson.....	"	2	.....	"	270	.34	91.80	.....
West.....	"	2	.....	"	340	.34	115.60	.....
"	"	2	.....	"	315	.34	107.10	.....
"	"	3	.....	"	688	.59	405.92	.....
"	"	3	.....	"	367	.59	216.53	70
"	"	2	.....	"	330	.34	112.20	.....
Chandler.....	"	2	.....	"	370	.34	125.80	.....
Cross.....	"	2	.....	"	160	.34	55.50	.....
"	"	2	.....	"	350	.34	119.00	.....
"	"	2	.....	"	367	.34	124.78	.....
Mooney.....	"	2	.....	"	780	.34	265.20	.....
Centre.....	"	4	.....	1918	3,040	.82	2,492.80	80
"	"	4	.....	1910	360	.82	295.20	.....
"	"	4	.....	"	330	.82	270.60	.....
"	"	4	.....	"	350	.82	287.00	20
St. George.....	P	2	.....	"	2,480	.34	844.30	.....
"	"	2	.....	"	1,665 (S)	.32	532.80	80
"	"	4	.....	"	1,150	.82	943.00	.....
"	"	3	S.H.	1922	2,750	.59	161.05	.....
"	"	4	.....	1910	1,040	.82	852.80	90

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
Tecumseh.....	U	2	.....	1910	.....	560	\$0.34	\$191.50	.....
Wellington.....	"	3	.....	"	.....	300	.59	177.00	.....
Water.....	"	3	.....	"	.....	1,450	.59	843.50	.....
"	"	2	.....	"	.....	400	.34	136.00	.....
St. George.....	P	4	.....	"	.....	400	.82	328.00	.....
"	"	3	.....	"	.....	820	.59	471.80	.....
"	"	2	.....	"	.....	580	.34	198.30	.....
"	"	2	.....	"	.....	50	.34	17.00	.....
"	"	3	S.H.	1922	.....	1,120	.59	660.80	.....
Off St. George.....	U	1 1/2	.....	1910	.....	280	.21	58.80	.....
D.D. St.....	"	2	.....	"	.....	850	.34	290.10	.....
Dominion.....	"	2	.....	"	.....	330	.34	114.40	90
Rufus.....	"	2	.....	"	.....	180	.34	63.40	.....
James.....	"	2	.....	"	.....	430	.34	148.40	.....
"	"	2	.....	"	.....	600	.34	204.00	.....
Talbot.....	"	4	.....	"	.....	200	.82	164.00	80
"	"	1 1/4	.....	"	.....	220	.18	39.60	.....
"	"	4	.....	"	.....	300	.82	246.00	.....
William.....	"	2	.....	"	.....	250	.34	85.00	.....
Lane rear St. George.....	"	3	.....	"	.....	350	.59	206.50	80
Main.....	P	1	.....	"	.....	110	.15	16.50	.....
Water.....	U	3	.....	"	.....	680	.59	401.20	.....
Total.....								\$29,407.45	.....

(S) Surface

FLETCHER

Tileyard.....	U	2	1914	2,096	\$0.34	\$712.64	65
".....	"	3	"	30	.59	17.70	65
Concession VI.....	"	2	"	885	.34	289.00	65
".....	"	1 1/2	"	355	.21	74.55	65
".....	"	1	"	115	.15	17.25	65
Town line.....	"	1	"	120	.15	18.00	65
".....	"	2	"	792	.34	269.28	65
".....	"	2	"	765	.34	260.10	65
".....	"	1 1/2	"	294	.21	61.74	65
Total.....						\$1,720.26	

FROOMFIELD

Brickyard line.....		2	1911	2,790	\$0.34	\$948.60	70
River Rd.....		2	"	2,010	.34	683.40	70
Unnamed.....		2	"	365	.34	124.10	70
Top.....		1 1/4	"	129	.18	23.22	70
".....		1	"	130	.15	19.50	70
".....		2	"	60	.34	20.40	70
School line, off Sarnia line.....		2	"	780 (S)	.32	156.00	70
Total.....						\$1,975.22	

MAIDSTONE

(S) Surface		2	1910	174 (S)	\$0.32	\$55.68	90
		2	"	78 (S)	.32	24.96	90
		2	"	150 (S)	.32	48.00	90
		1	"	471 (S)	.13	61.23	90
		2	"	69 (S)	.32	22.08	90
		2	"	435 (S)	.32	139.20	90
		2	"	1,540 (S)	.32	492.80	90
Total.....						\$843.95	
(S) Surface							

MOORETOWN

No name.....	U	1 1/4	1916	232	\$0.18	\$41.76	80
William.....	"	2	1914	310	.34	105.40	90
".....	"	6	"	400	1.44	576.00	
".....	"	2	"	52	.34	17.68	
".....	"	2	"	510	.34	173.40	
James.....	"	2	"	290	.34	98.60	
".....	"	2	"	335	.34	113.90	
".....	"	2	"	655	.34	222.70	
Lane.....	"	2	"	350	.34	119.00	60
Napoleon.....	"	2	"	335	.34	113.90	
Sophia.....	"	2	"	370	.34	125.80	
Emily.....	"	1	"	132	.15	19.80	
".....	"	2	"	533	.34	180.88	
Poultney.....	"	1	"	80	.15	12.00	
".....	"	2	"	533	.34	180.88	
St. Clair.....	"	2	"	275	.34	93.50	
".....	"	2	"	785	.34	266.98	
McDonald.....	"	2	"	130	.34	44.20	
Poultney.....	"	2	"	65	.34	22.10	
".....	"	1 1/2	"	115	.21	24.15	
Total.....						\$2,552.62	

MORPETH

Main.....	U	2	1918	100	\$0.34	\$34.00	70
".....	"	2	"	660	.34	224.40	
".....	"	2	"	590	.34	200.60	
".....	"	2	"	403	.34	137.02	
".....	"	2	"	360	.34	122.40	
".....	"	2	"	240	.34	81.60	
".....	"	2	"	300	.34	102.00	90
".....	"	2	"	120	.34	40.80	
".....	"	2	"	60	.34	20.40	
".....	"	2	"	1,902	.34	646.68	

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
MORPETH—Continued.									
Mill.....	U	2	.....	1918	.....	585	\$0.34	\$198.90	.....
Tylee.....	"	2	.....	"	.....	370	.34	125.80	.....
".....	"	2	.....	"	.....	300	.34	102.00	.....
".....	"	2	.....	"	.....	223	.34	75.82	80
".....	"	1	.....	"	.....	118	.15	17.70	.....
".....	"	1	.....	"	.....	107	.15	16.05	60
Sydenham.....	"	2	.....	"	.....	512	.34	174.08	70
".....	"	2	.....	"	.....	370	.34	125.80	.....
Furnace.....	"	2	.....	"	.....	321	.34	109.14	.....
".....	"	1	.....	"	.....	670	.15	100.50	.....
John.....	"	2	.....	"	.....	420	.34	142.80	.....
Talbot.....	"	2	.....	"	.....	40	.34	13.60	90
".....	"	2	.....	"	.....	700	.34	238.00	.....
".....	"	2	.....	"	.....	655	.34	222.70	.....
".....	"	2	.....	"	.....	60	.34	20.40	.....
".....	"	2	.....	"	.....	870	.34	295.80	.....
".....	"	2	.....	"	.....	465	.34	158.10	.....
Clark.....	"	2	.....	"	.....	508	.34	172.72	.....
Total.....								\$3,919.81	.....

NORTH WOODSLEE

Middle Rd.....	U	2	.....	1909	.....	145 (S)	\$0.32	\$464.64	.....
".....	"	2	.....	"	.....	132 (S)	.32	42.24	.....
".....	"	2	.....	"	.....	220 (S)	.32	70.40	.....
".....	"	1 1/4	.....	"	.....	90 (S)	.17	15.30	.....
".....	"	1	.....	"	.....	100 (S)	.13	13.00	.....

S. Woodslee Rd.....	"	2	.....	"	.....	600	.34	204.00	.....
Side street.....	"	2	.....	"	.....	300	.34	102.00	.....
	"	1 1/4	.....	"	.....	85	.18	15.30	.....
Total.....								\$926.88	.....

(S) Surface

PAINCOURT

Creek Rd.....	U	2	S.H.	1910	.....	500 (S)	\$0.32	\$160.00	.....
"	"	2	"	"	.....	1,050 (S)	.32	336.00	.....
"	"	2	"	"	.....	500	.34	170.00	.....
"	"	4 1/4	"	1915	.....	2,640	.60	1,584.00	70
"	"	2	S.H. (leaky)	1910	.....	8,440	.34	2,869.60	.....
Total.....	"	2	S.H.	"	.....	450	.34	153.00	.....
(S) Surface								\$5,272.60	.....

PORT ALMA

James.....	U	2	.....	1914	.....	348	\$0.34	\$118.32	75
Back houses.....	"	3	.....	"	.....	350	.59	206.50	75
Talbot Rd.....	"	3	.....	"	.....	56	.59	33.04	75
"	"	3	.....	"	.....	45	.59	26.55	75
"	"	3	.....	"	.....	24	.59	14.16	75
"	"	3	.....	"	.....	40	.59	23.00	75
"	"	3	.....	"	.....	495	.59	292.05	75
Total.....								\$713.62	.....

PORT LAMBTON

Front.....	U	2	.....	1916	.....	220 (S)	\$0.32	\$70.40	.....
"	"	3	.....	"	.....	544 (S)	.56	304.64	90
"	"	3	.....	"	.....	2,800 (S)	.56	1,568.00	.....
"	"	2	.....	"	.....	300 (S)	.32	96.00	.....
McDonald.....	"	2	.....	"	.....	449	.34	152.66	.....

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
PORT LAMBTON—Continued									
McDonald.....	U	1 1/4	.....	1916	.....	213	\$0.18	\$38.34	.....
Merritt.....	"	2	.....	"	.....	855	.34	290.70	.....
"	"	1 1/4	.....	"	.....	170	.18	30.60	90
Queen.....	"	2	.....	"	.....	305	.34	103.70	.....
Stoddard.....	"	3	.....	"	.....	286	.59	168.74	.....
"	"	2	.....	"	.....	154	.34	52.36	.....
" to meter.....	"	3	.....	"	.....	100	.59	59.00	80
John.....	"	2	.....	"	.....	360	.34	122.40	80
"	"	2	.....	"	.....	446	.34	151.64	.....
Broadway.....	"	2	.....	"	.....	687	.34	233.58	80
Moore.....	"	1 1/4	.....	"	.....	145	.18	26.10	.....
William.....	"	2	.....	"	.....	559	.34	190.06	80
Total.....								\$3,659.46	.....

(S) Surface

RIDGETOWN

Algonquin.....	U	2	N	1909	.....	120	\$0.34	\$40.80	.....
Brant.....	"	2	"	"	.....	1,027	.34	349.18	.....
Tecumseh.....	"	2	"	"	.....	670	.34	227.80	.....
James.....	"	2	"	"	.....	460	.34	156.40	.....
Lane.....	"	2	"	"	.....	333	.34	113.22	.....
"	"	2	"	"	.....	380	.34	129.20	.....
Tiffany lane.....	"	2	"	"	.....	500	.34	170.00	.....
Cathcart.....	"	2	"	"	.....	366	.34	124.44	.....
"	"	3	"	"	.....	426	.59	251.34	.....
"	"	2	"	"	.....	960	.34	326.40	.....

Tiffany lane.....	"	2	"	"	850	.34	289.00	80
York.....	"	2	"	1916	400	.34	136.00	
"	"	8	"	1909	380	1.94	737.20	
"	"	3	N	1916	800	.59	472.00	80
"	"	8	"		1,100	1.94	2,153.40	90
York lane.....	"	2	N	1909	1,143	.34	388.62	
Main.....	P	3	"	"	413	.59	243.67	
"	"	2 1/2	"	"	460	.43	197.80	
"	"	4	"	"	1,300	.82	1,066.00	
"	"	4	S.H.	1921	1,454	.82	1,192.28	
"	"	3	N	1909	1,330	.59	784.70	
"	"	3	"	"	500	.59	295.00	
"	"	3	S.H.	1921	1,455	.59	858.45	
"	"	3	N	1909	36	.59	21.24	
"	"	2	"	"	2,055	.34	698.70	
"	"	2	"	"	1,081	.34	367.54	90
"	"	2	"	"	2,055	.34	698.70	80
Ebenezer.....	U	3	"	"	1,990	.59	1,174.10	
"	"	3	"	"	2,175	.59	1,283.25	
Jane.....	"	3	"	"	2,175	.59	1,283.25	
"	"	2	"	"	410	.34	139.40	
George.....	"	3	"	"	1,035	.59	610.65	
David.....	"	2	"	"	610	.34	207.40	90
"	"	3	"	"	1,265	.59	746.35	90
John.....	"	2	S.H.	1921	280	.34	95.20	
"	"	2	N	1909	360	.34	122.40	
"	"	2	"	"	440	.34	149.60	60
Oak.....	"	2	S.H.	1921	670	.34	227.80	
"	"	1 1/4	N	1909	253	.18	45.54	
Chestnut.....	"	2	"	"	305	.34	103.70	
Main.....	P	4	"	"	642	.82	526.44	
"	"	2	"	"	1,120	.34	380.80	
Henry.....	U	2	"	"	352	.34	119.68	
Maple.....	"	2	"	"	800	.34	272.00	
"	"	2	"	"	242	.34	82.28	
"	"	1	"	"	180	.15	27.00	
King.....	"	2	"	"	175	.34	59.50	
"	"	2	"	"	400	.34	136.00	

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
King.....	U	2	N	1909	.....	800	\$0.34	\$272.00	.....
Pearl.....	"	3	"	"	.....	400	.59	236.00	.....
"	"	2	"	"	.....	800	.34	272.00	.....
"	"	2	"	"	.....	665	.34	226.10	80
"	"	8	"	"	.....	330	1.94	640.20	.....
Marsh.....	"	2	S.H.	1921	.....	365	.34	124.10	90
"	"	2	N	1909	.....	115	.34	39.10	.....
"	"	3	"	"	.....	392	.59	225.78	.....
"	"	2	"	"	.....	417	.34	141.78	.....
Lane (regulator).....	"	2	"	"	.....	290	.34	98.60	.....
"	"	3	"	"	.....	35	.59	20.65	.....
Erie.....	"	8	"	"	.....	579	1.94	1,123.26	80
"	P	8	N	1909	.....	2,313	1.94	4,487.22	80
"	U	8	.....	1916	.....	360	1.94	698.40	.....
"	"	3	N	1909	.....	1,385	.59	817.15	80
"	"	2	.....	"	.....	655	.34	222.70	.....
"	P	4 1/4	S.H.	1921	.....	2,315	.60	1,389.00	.....
"	U	4	N	1909	.....	360	.82	295.20	.....
"	"	2	"	"	.....	3,135	.34	1,065.90	.....
Albert.....	"	2	"	"	.....	1,010	.34	343.40	.....
"	"	1 1/4	"	"	.....	85	.18	15.30	.....
Victoria.....	"	3 3/4	"	"	.....	157	.11	17.27	.....
"	"	2	"	"	.....	1,000	.34	340.00	.....
Church lane.....	"	3	S.H.	1922	.....	190	.59	112.10	.....
Victoria.....	"	2	N	1909	.....	156	.34	53.04	.....
"	"	3	"	"	.....	350	.59	206.50	.....
"	"	3	"	"	.....	207	.59	122.13	80

RIDGETOWN—Continued

"	"	"	"	"	490	.34	166.60	90
"	"	"	"	"	2,474	.34	841.16	
"	"	"	"	"	250	.59	147.50	
Broadway	"	"	1921	"	210	.34	71.40	80
"	"	"	"	"	520	.34	176.80	60
"	"	"	1909	"	780	.34	265.20	
"	"	"	"	"	675	.59	398.25	
Cunningham	"	"	"	"	350	1.94	679.00	
"	"	"	"	"	380	.59	213.20	
"	"	"	"	"	460	.34	156.40	
Lisgar	"	"	"	"	750	.34	255.00	
Head	"	"	1921	"	329	.34	111.86	
Harold	"	"	1909	"	800	.34	272.00	80
"	"	"	"	"	700	.34	238.00	
"	"	"	"	"	200	.34	68.00	
Head	"	"	"	"	371	.34	126.14	
Cecil	"	"	1921	"	489	.34	166.26	
"	"	"	1909	"	255	.34	86.70	
Harold	"	"	"	"	142	.34	48.28	
"	"	"	"	"	390	.59	230.10	
York	"	"	"	"	800	.59	472.80	80
"	"	"	"	"	1,130	.59	666.70	80
"	"	"	"	"	355	.34	120.70	
Total							\$39,863.35	

RONDEAU

	1	1914	1,010 (S)	\$0.13	\$131.30	90
(S) Surface						

RUSCOMB

U	2	1909	1,000	\$0.34	\$340.00	80
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DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
St. JOACHIM									
	U	2	.....	1912	.....	1,293	\$0.34	\$439.62	.....
	"	2	.....	"	.....	426	.34	144.84	60
	"	2	.....	"	.....	315	.34	107.10	.....
	"	2	.....	"	.....	308	.34	104.72	.....
	"	2	.....	"	.....	68	.34	23.12	.....
	"	2	.....	"	.....	356	.34	121.04	.....
	"	2	.....	"	.....	1,308	.34	444.72	80
	"	8	S.H.	"	.....	125	1.94	242.50	70
Total.....								\$1,627.66	.....
SHREWSBURY TOWN									
	U	1	.....	1914	.....	1,678	\$0.13	\$218.14	90
	"	3/4	.....	"	.....	62	.10	6.20	90
	"	1	.....	"	.....	83	.13	10.79	90
	"	3/4	.....	"	.....	403	.10	40.30	90
	"	1	.....	"	.....	954	.13	124.02	90
	"	3/4	.....	"	.....	234	.10	23.40	90
	"	3	.....	"	.....	563	.56	315.28	90
	"	2	.....	"	.....	1,100	.32	352.00	90
	"	1	.....	"	.....	1,910	.13	248.30	90
	"	1	.....	"	.....	425	.13	55.25	90
	"	2	.....	"	.....	533	.32	170.56	90
	"	1	.....	"	.....	1,230	.13	159.90	90
Total.....								\$1,724.14	.....

All surface lines.

SOMBRA

	U	6	S.H.	1915		2,930	\$1.44	\$4,219.20	70
St. Clair.....	"	2	"	"	.....	38	.34	12.92	.....
Water.....	"	3	"	"	.....	825	.59	486.75	80
"	"	3	"	"	.....	630	.59	371.70	.....
John.....	"	3	"	"	.....	155	.59	91.45	80
"	"	3	"	"	.....	1,070	.59	631.30	.....
South.....	"	3	"	"	.....	325	.59	191.75	70
"	"	6	"	"	.....	104	1.44	149.76	70
King.....	"	1	"	"	.....	130	.15	19.50	.....
"	"	3	"	"	.....	657	.59	387.63	80
Maple.....	"	3	"	"	.....	220	.59	129.80	.....
George.....	"	2	"	"	.....	327	.34	111.18	.....
North.....	"	2	"	"	.....	288	.34	97.92	.....
Concession Road.....	"	2	"	"	.....	465	.34	158.10	70
Total.....	\$7,058.96	.....

SOUTH WOODSLEE

	U	2	N	1909		380	\$0.34	\$129.20	.....
South.....	"	1	"	"	.....	325	.15	48.75	.....
Victoria.....	"	2	"	"	.....	260	.34	88.40	.....
"	"	2	"	"	.....	420	.34	142.80	.....
King.....	"	1	"	"	.....	40	.15	6.00	.....
Church.....	"	1	"	"	.....	90	.15	13.50	.....
"	"	2	"	"	.....	835	.34	283.90	.....
North.....	"	2	"	"	.....	225	.34	76.50	.....
Main.....	"	2	"	"	.....	285	.34	96.90	.....
"	"	2	"	"	.....	50	.34	17.00	.....
"	"	2	"	"	.....	403	.34	137.02	90
"	"	2	"	"	.....	100	.34	34.00	.....
"	"	3	"	"	.....	1,008	.59	594.72	80
North.....	"	2	"	"	.....	1,075	.34	365.50	.....
Meter.....	2	N	"	.....	75(S)	.32	24.00	.....

DISTRIBUTION MAINS—Continued

Street	Pav. or Unp.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, feet	Unit price	Reproduction cost new	Effi- ciency, per cent.
SOUTH WOODSLEE—Continued									
Meter.....		3	N	1909		75 (S)	\$0.56	\$42.00	.....
Total.....								\$2,100.19	.....
(S) Surface									
TECUMSEH									
William.....	U	2		1914		1,250	\$0.34	\$425.00	60
St. Denis.....	"	2		1911		116	.34	39.44	.....
".....	"	2		"		50	.34	17.00	.....
".....	"	3		"		134	.59	79.06	.....
".....	"	3		"		222	.59	130.98	.....
".....	"	2		"		304	.34	103.36	.....
St. Louis.....	"	4		1914		637	.82	522.34	80
St. Pierre Avenue.....	"	2		"		1,550	.34	527.00	80
Lesperance Road.....	"	2		1911		354	.34	120.36	.....
".....	"	2		"		60	.34	20.40	.....
".....	"	2		"		530	.34	180.29	.....
".....	"	4		1923		1,717	.82	1,407.94	95
".....	"	2		1911		300	.34	102.00	80
North of Grand Trunk Railway.....	"	2		"		950	.34	323.00	.....
Bedell Avenue.....	"	2		1919		650	.34	221.00	80
Church.....	"	2		1911		747	.34	253.98	.....
Morand.....	"	2	S.H.	1919		747	.34	253.98	80
Cartier.....	"	2		1911		470	.34	159.80	.....
Lesperance Road.....	"	2		"		1,734	.34	589.56	.....
Tecumseh Road.....	P	2		"		270	.34	91.80	.....
".....	"	4		"		683	.82	560.06	80
".....	"	2		"		1,140	.34	378.60	.....

"	"	1 1/4	"	91	.18	16.38	.....
"	"	2	"	400	.34	136.00	70
"	"	6 1/4	1913	2,200	1.21	2,662.00	70
Meter.....							
"		6 1/4	S.H.	434 (S)	1.17	507.78	.....
		2	"	90 (S)	.32	28.80	.....
Total.....						\$9,857.82	.....

(S) Surface

TILBURY

Louise.....	U	1 1/2	S.H.	1907		270	\$0.21	\$56.70	.....
"	"	2	"	"		1,030	.34	350.20	.....
Centre.....	"	5 5/8	"	1914		218	1.06	231.08	30
"	"	4	"	1907		386	.82	316.52	.....
"	"	2	"	"		363	.34	123.42	.....
Mill.....	"	2	"	"		300	.34	102.00	.....
Victoria.....	"	2	"	"		300	.34	102.00	.....
"	"	2	"	"		1,525	.34	518.50	.....
Queen.....	P	4	"	"		135	.82	110.70	.....
"	"	6 1/4	"	"		208	1.21	251.68	.....
"	"	5 5/8	"	1915		375	1.06	397.50	.....
"	"	2	"	1907		620	.34	210.80	.....
Dufferin.....	U	2	"	"		304	.34	103.36	.....
"	"	1 1/2	"	"		112	.21	23.52	.....
End.....	"	2	"	"		232	.34	78.88	.....
Smith.....	"	2	N	"		630	.34	214.20	.....
Young.....	P	2	"	1921		840	.34	285.60	.....
"	"	2	"	1907		1,490	.34	506.60	.....
Canal.....	"	2	N	1921		1,620	.34	550.80	.....
"	.....	4		1907		1,450	.82	1,189.00	70
"	"	3		"		100	.59	59.00	.....
"	"	5 5/8	S.H.	1914		240	1.06	254.40	60
"	"	2	"	1907		680	.34	231.20	.....
"	U	2	"	"		920	.34	312.80	.....
Peltier.....	"	2	"	"		200	.34	68.00	.....

DISTRIBUTION MAINS—Continued

Sheet No.	Dia- meter, inches	New or S.H.	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
TILBURY—Continued									
Market line.....	P	4	.....	1907	1921	590	\$0.82	\$483.80	.....
Fort.....	"	4	.....	"	"	1,260	.82	1,025.00	.....
"	"	5 $\frac{5}{8}$	.....	.....	.....	45	1.06	47.70	.....
"	"	2	N	1921	.....	190	.34	64.66	.....
Stewart.....	U	2	.....	{1907 1916}	.....	1,727	.34	587.18	80
St. Marie.....	"	1	.....	{1907 1916}	.....	245	.15	36.75	.....
Queen.....	P	4	.....	"	1915	2,835	.82	2,324.70	80
Canal.....	"	2	.....	1910	.....	400	.34	136.00	.....
Canal St. E.....	"	4	.....	"	.....	1,640	.82	1,344.80	.....
Ella.....	.....	2	.....	"	.....	404	.34	137.36	.....
St. Clair.....	P	4	.....	"	.....	110	.82	90.20	.....
Queen.....	"	4	.....	1907	.....	460	.82	377.20	.....
"	"	4	.....	"	.....	680	.82	557.60	.....
Rear lane.....	U	2	.....	1918	.....	523	.34	177.82	90
Cathcart.....	"	2	.....	1907	.....	1,000	.34	340.00	.....
Carlyle.....	P	2	.....	"	1921	870	.34	295.80	.....
"	"	3	S.H.	1921	.....	870	.59	513.30	.....
Forrest.....	"	2	.....	1907	1921	870	.34	295.80	.....
"	"	2	N	1921	.....	450	.34	153.00	.....
Mabel.....	U	2	.....	{1916 1917}	.....	870	.34	295.80	80
James.....	"	2	.....	1907	.....	360	.34	122.40	.....
Ella.....	"	2	.....	"	.....	300	.34	102.00	.....
"	"	5 $\frac{5}{8}$	S.H.	1914	.....	567	1.06	601.02	60
"	"	5 $\frac{5}{8}$	"	1907	.....	106	1.06	112.36	.....
Superior.....	P	2	"	1916	.....	388	.30	131.92	.....
"	"	3	"	1907	.....	245	.59	144.55	.....
"	"	2	"	"	.....	160	.34	54.40	.....
Prospect.....	"	4	"	"	.....	650	.82	533.00	80

DISTRIBUTION MAINS—Continued

Street or Street No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
WILKESPORT										
Concession Road.....	2	S.H.	.....	1910	.....	1,530 ft.	.....	\$0.34	\$520.20	80
".....	2	"	.....	"	.....	730 ft.	.....	.34	248.20	80
Side road.....	1	"	.....	"	.....	495 ft.	.....	.15	74.25	70
".....	2	"	.....	"	.....	2,055 ft.	.....	.34	698.70	.....
Total.....	.....	.....	.....	.....	.....	.....	.....	.....	\$1,541.35	.....
ARMSTRONG AND COFFEE										
11.....	1	S.H.	.....	1912-14	.....	30 ft.	.....	\$0.15	\$4.50	.....
HASKELL AND REIGNER										
11.....	1	S.H.	.....	1912-14	.....	90 ft.	.....	\$0.15	\$13.50	.....
JOHNSON MIFFIN										
11.....	1	S.H.	.....	1912-14	.....	0.78	.....(S)	\$713.00	\$556.14	90
FUR LINE										
11.....	1	S.H.	.....	1912-14	.....	0.30	.....(S)	\$713.00	\$213.90	.....

DOVER No. 4, NORTHERN

9.....	1 1/4 1	Sc. "	1917 "	2,055 ft. 3,430 ft.(S)(S)	\$0.16 1/2 .13 1/2	\$334.48 460.30	90 90
Total.....								\$794.78

DOVER No. 3, NORTHERN

9.....	1	Sc.	1916	0.80(S)	\$713.00	\$570.40	80
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DOVER No. 1, UNION

9.....	1 1/2 2	N S.H.	1915 "	4,500 ft. 550 ft.(S)(S)	.20 .32	\$900.00 176.00	90
Total.....								\$1,076.00

DOVER—CONCESSIONS VIII AND IX

9.....	1	S.H.	1913	1.20(S)	\$713.00	\$855.60	70
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CHARING CROSS

14.....	3 3	N "	1908 "	4.40 1.60	323 (S) 324 (S)	\$2,983.00 2,983.00	\$13,125.20 4,772.80	70 60
Total.....								\$17,898.00

RHODES

14.....	1	2.44	325	\$792.00	\$1,932.48	70
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DISTRIBUTION MAINS—Continued.

Sheet No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit Price	Reproduction cost new	Effi- ciency, per cent.
RALEIGH—CONCESSION IX										
14.....	1 1/2	.....	.....	.....	1922	2.40	.....(S)	\$1,056.00	\$2,534.40	80
	1 1/4	.....	.....	.....	"	1.80	326 (S)	872.00	1,569.60	80
Total.....	.....	.....	.....	.....	.....	.....	.....	.....	\$4,104.00	.....
RALEIGH FARMERS' LINE—CONCESSION VIII										
14.....	1	.....	Sc.	.....	.....	170 ft.	.....	\$0.15	\$25.50	.....
RALEIGH FARMERS' LINE—CONCESSION VII										
14.....	1	.....	Sc.	.....	.....	84 ft.	.....	\$0.15	\$12.60	.....
RALEIGH FARMERS' LINE—MIDDLE ROAD										
14.....	1 1/2	.....	Sc.	.....	.....	75 ft.	.....	\$0.21	\$15.75	.....
HIGH BANKS										
15.....	1	.....	Sc.	1915	.....	0.60	.....(S)	\$713.00	\$427.80	80

TAYLOR

15.....	1	Sc.	.....	.....	0.40	.....(S)	\$713.00	\$285.20	70
SHREWSBURY VICINITY									
14.....	2	S.H.	1915	.....	0.55	328	\$1,795.20	\$987.36	50
18.....	1 1/4	"	"	.....	1.25	.....	950.40	1,188.00	50
18.....	1	"	"	.....	0.70	.....	792.00	554.40	.....
18.....	1 1/2	"	"	.....	0.85	.....	1,108.80	942.48	.....
.....	1 1/2	"	"	.....	0.55	.....	1,108.80	609.84	.....
.....	1 1/2	"	"	.....	1.30	.....	1,108.80	1,441.44	.....
Total.....					.....	.....	.....	\$5,723.52	.....

BLENHEIM VICINITY

14. Concession II.....	2	Sc.	1915	.....	0.75	327	\$1,795.20	\$1,346.40	80
Pumphouse.....	2	"	"	0.25	1,795.20	448.80	80
Total.....					\$1,795.20

RONDEAU HARBOUR

18.....	2	S.H.	1915	1920	2.40	\$1,795.20	\$4,308.48	80
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SHREWSBURY TO NEW SCOTLAND

18.....	2	S.H.	1916	1.30	55	\$1,795.20	\$2,333.76	80
.....	2	"	"	3.00	57	1,795.20	5,385.60	80
.....	2	.....	.....	1923	0.30	61	1,795.20	538.56	.....
Total.....					.....	.....	.....	\$8,257.92	.....

DISTRIBUTION MAINS

Sheet No.	Dia- meter, inches	New or S.H.	Joint	Laid	Relaid	Length, miles	Exposure No.	Unit price	Reproduction cost new	Effi- ciency, per cent.
RONDEAU ROAD—TALBOT ROAD TO NEW SCOTLAND										
18.....	2	N	.....	.....	1923	0.30	59	\$1,795.20	\$538.56	100
	2		.....	.....	.....	0.95	89	1,795.20	1,705.44	90
Total.....									\$2,244.00	.....
EAST OF NEW SCOTLAND										
18.....	1	.....	.....	1915	.....	1.00	.....	\$792.00	\$792.00	.....
NEW SCOTLAND TO LAKE										
18.....	2	N	.....	.....	1923	0.45	.....	\$1,795.20	\$807.84	100
	2	S.H.	.....	.....	"	1.20	62	1,795.20	2,154.24	90
	2	"	.....	.....	"	1,006 ft.	.....	34	342.04	.....
	1 1/4	.....	.....	.....	.....	0.65	.....	950.40	617.76	.....
	1	.....	Sc.	1915	.....	0.60	.....	792.00	475.20	.....
			"	"
Total.....									\$4,397.08	.....
LACREEK										
18.....	1 1/4	.....	Sc.	1915	.....	1.10	.....	\$950.40	\$1,045.44	.....
	1	.....	"	"	.....	0.25	.....	792.00	198.00	.....
Total.....									\$1,243.44	.....

RAGLAN LINE

18.....	1 1/2	.....	Sc.	1915	.....	1,700 ft.	..... (S)	\$0.20	\$340.00	.....
	1	.....	"	"	.....	400 ft.	..... (S)	.13 1/2	44.00	.....
	1	.....	"	"	.....	1,820 ft.	..... (S)	.13 1/2	245.70	.....
	1	"	"	1,600 ft. (S)	.13 1/2	176.00
Total.....		\$805.70

INDIAN CREEK—EAST OF GILES

18.....	1	Sc.	1915	2,100 ft. (S)	\$0.13 1/2	\$283.50
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(S) Surface

REGULATORS AND CHECKING METERS

An inventory of all fittings included in the regulator and checking houses is submitted.

As already stated, the company's books were not devised to give the cost of separate sections of the plant. The regulators were installed on the lines about the same time as the transmission lines were constructed. The meters were originally installed at industrial works, but when industrial consumption of gas was stopped, they were removed and used at the regulator houses. We must, therefore, assume that the age of the regulators and meters is about the same as the transmission lines.

Original Cost

To arrive at the original cost of the regulators, etc., we apply the Canadian steel pipe cost index numbers and adopt the same proportion of work done prior to 1915, as in the case of transmission lines. Therefore,

Work done 1914 and earlier = 65 per cent. of \$86,399.36 = \$56,200

Work done 1915 to 1923 = 35 per cent. of \$86,399.36 = \$30,200

$$\$56,200 \times \frac{100}{192.5} = \$28,200$$

$$\$30,200 \times \frac{179}{192.5} = \$28,100$$

Probable original cost = \$56,300

Depreciation

The condition of the regulators and meters is generally satisfactory, and we do not suggest any expenditure for restoration to normal operating efficiency.

The physical depreciation of the regulators, etc., is about 20 per cent., or \$17,280.

The accrued retirement reserve will, as in other parts, depend upon the duration of the gas fields. We have estimated the life of the gas field at 12 years from the present time, or 21 years, calculating from 1914. Therefore the retirement reserve, less a residual value of 25 per cent. of the reproduction cost new, on a straight line basis should be $\frac{9}{21}$ of \$64,799, or \$27,770, and on the basis of a 5 per cent. sinking fund it would be $\$64,799 \times 9 \times 0.02799$, or \$16,330.

REGULATOR AND METER STATIONS
SUMMARY OF REPRODUCTION COST, ETC.

Page	Name of regulator, etc.	Reproduction cost new
140	Blenheim (orifice meter).....	\$1,302.98
141	Blenheim No. 2.....	174.00
141	Cedar Springs.....	443.00
142	Ridgetown No. 1 (orifice meter).....	1,754.21
143	Ridgetown (Water and York).....	278.23
144	Ridgetown (Cunningham street).....	282.51
144	Tilbury No. 2 (Ella street).....	812.60
145	Tilbury No. 1 (Canal street), orifice meter.....	1,666.01
146	River road, Northern.....	464.78
146	Prairie Siding.....	107.02
147	River road, low pressure, Northern.....	88.00
147	No. 3 pump, Tilbury East.....	905.72
148	No. 2 pump, Tilbury East.....	729.66
148	Jeannette creek.....	320.33
149	No. 1 pump, Tilbury East.....	830.34
150	St. Joachim.....	749.68
150	Deerbrook.....	82.65
150	Ruscomb.....	857.37
151	Comber line.....	206.18
151	Comber.....	844.14
152	Farmers' pump.....	641.42
153	River road, Raleigh.....	442.58
153	Paincourt, low pressure.....	612.43
154	Paincourt, high pressure.....	178.70
154	Concession IV, Dover Union.....	185.40
155	Concession IV, Dover Northern.....	202.85
155	Town line, Dover East and West.....	108.07
156	High pressure regulator, Tilbury.....	277.67
156	Belle river.....	485.04
156	Off Belle River line.....	48.35
157	North Woodslee.....	289.41
157	South Woodslee.....	444.83
157	South Woodslee brickyard.....	405.31
158	High pressure regulator, Belle river.....	184.00
158	High pressure regulator, Essex line.....	186.03
158	Jessop line.....	103.40
159	Essex No. 1.....	486.05
159	Essex school.....	223.67
160	Essex No. 2.....	278.18
160	Maidstone.....	319.70
161	Maidstone, off Windsor line.....	129.35
161	Windsor (orifice meter).....	7,680.37
164	Grand Maris road.....	270.90
164	Windsor line connection.....	51.24
165	Tecumseh line.....	351.33
165	Tecumseh, low pressure.....	435.83
166	Dover meter house (orifice meter).....	1,365.61
166	Farmers' line, concession VII.....	269.56
166	Farmers' connection, concession IX.....	280.52
167	11th Concession line, Dover centre.....	299.97
167	No. 3 Northern.....	188.22
167	Shrewsbury line.....	511.16

REGULATOR AND METER STATIONS—*Continued*

Page	Name of regulator, etc.	Reproduction cost new
168	Shrewsbury, low pressure.....	\$255.07
168	Rondeau.....	454.32
169	Morpeth.....	702.94
169	Morpeth, Talbot road.....	173.75
169	Morpeth, Erie street.....	173.75
169	Guild's farmer line, No. 2.....	157.48
170	Concession II, Harwich.....	346.14
170	Concession III.....	302.76
171	Concession IV, North.....	168.13
171	Concession IV, South.....	258.83
171	Gore, Farmers' North.....	53.39
172	Gore, Farmers', South.....	223.14
172	McGuigan's connection.....	203.25
172	Erie beach.....	237.25
173	Concession III, Von Slambrook.....	45.99
173	Cedar Springs, Talbot road.....	112.09
173	High Banks line.....	245.41
174	Dr. Campbell's line.....	86.75
174	Dr. Holmes' line.....	102.19
174	Ridgetown line (orifice meter).....	1,537.38
175	Queen street extension, Chatham.....	188.99
175	Houston street, Chatham.....	121.04
176	No. 2 Farmers' line, Dover.....	55.23
176	No. 4 Farmers', concession XIV.....	219.09
177	No. 5 Farmers' line, off Northern.....	166.03
177	No. 6 Farmers' line, Northern.....	166.03
177	Chatham township pump.....	637.59
177	No. 3 Union Farmers' line.....	429.88
178	Wallaceburg (orifice meter).....	7,025.31
179	Dresden line (orifice meter).....	677.11
180	Tupperville.....	535.86
180	Dresden town (orifice meter).....	494.39
181	Dresden, Holden street.....	492.95
181	Dresden, Centre street.....	354.29
182	Dresden, Water street.....	415.11
182	Dresden, Talbot street.....	415.31
183	Sombra line.....	743.39
183	Lambton line.....	333.83
183	Port Lambton.....	371.48
184	Sombra.....	980.80
185	Wilkesport, low pressure.....	331.17
185	Wilkesport, high pressure.....	126.74
185	Brigden line.....	696.10
186	Brigden.....	397.19
186	Mooretown line.....	880.97
187	Mooretown.....	472.90
188	Froomfield.....	52.04
188	Corunna.....	365.47
188	Courtright (meters).....	1,276.66
189	Parker line.....	92.42
189	Corunna line.....	508.24
190	Edwards line.....	67.38
190	Farmers' line, Brigden.....	125.67

REGULATOR AND METER STATIONS—*Continued*

Page	Name of regulator, etc.	Reproduction cost new
190	Sarnia (orifice meter).....	\$4,813.22
192	Petrolia.....	715.71
192	Marthaville line.....	146.14
192	McCaul line.....	95.91
193	Copleston regulator.....	302.04
193	Petrolia (orifice meter).....	529.31
194	Dawn field (orifice meter).....	440.80
194	Farmers' line, concession III.....	68.96
194	Moore Phipps line.....	55.54
194	Gospel Hall line.....	72.09
195	Johnson Miffin line.....	72.09
195	Fur line.....	54.96
195	Armstrong and Coffee line.....	54.96
196	Stevenson (orifice meter).....	1,266.50
196	Haskell and Reigner lines.....	76.71
196	Chatham line (orifice meter).....	665.96
197	Reid Farmers' line.....	74.50
197	Fletcher Kelley line.....	75.24
197	Chennick line.....	94.30
198	6th Concession line.....	364.09
198	Chrysler line.....	167.80
198	Rhodes line.....	225.47
199	Gilhully and Church lines.....	138.01
199	Valetta line.....	291.68
200	Northern line (orifice meter).....	1,571.69
200	Windsor back line.....	267.06
201	Merlin.....	636.81
201	Middle road.....	24.76
201	Gravel Road line.....	242.66
202	Cemetery line.....	265.18
202	7th Concession line.....	62.82
202	8th Concession line.....	73.80
203	9th Concession line.....	278.24
203	High pressure line at mill, Merlin.....	119.10
203	Merlin tileyard.....	469.77
204	Merlin booster.....	44.95
204	Kimball line.....	58.34
204	Mansell line.....	107.04
205	Rice line.....	59.66
205	Fletcher, low pressure.....	287.05
205	Fletcher tileyard.....	1,037.92
206	Cromwell and McFadden line.....	124.95
206	Port Alma, Lake Shore road.....	624.16
207	Chatham (orifice meter).....	4,725.68
208	Gravel Road line.....	803.63
208	Port Alma (orifice meter).....	6,409.65
209	Fuel line to boiler and pump house.....	218.49
210	Bradley.....	131.43
	Total.....	\$86,399.36

BLENHEIM REGULATOR STATION

Quantity	Item	Unit cost	Reproduction cost new
1	3 in. x 2 in. heavy cast tee.....		\$2.43
1	3 in. x 3 in. heavy cast tee.....		2.43
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. brass stop cock.....		3.35
4	3 in. nipples.....	\$0.43	1.72
1	3 in. No. 8 Ludlow heavy pressure valve.....		27.59
1	3 in. heavy pressure Chaplin-Fulton regulator.....		126.00
1	3 in. x $\frac{1}{2}$ in. Dresser saddle.....		2.03
1	3 in. x 2 in. Dresser saddle.....		2.03
1	2 in. nipple.....		.16
1	2 in. x $1\frac{1}{2}$ in. reducer.....		.25
5	$1\frac{1}{2}$ in. nipples.....	.10	.50
1	$1\frac{1}{2}$ in. stop cock.....		2.24
1	$1\frac{1}{2}$ in. lip union.....		.41
1	$1\frac{1}{2}$ in. Emco high pressure regulator.....		71.00
2	$1\frac{1}{2}$ in. elbows.....	.21	.42
1	$1\frac{1}{2}$ in. street elbow.....		.24
2	$1\frac{1}{2}$ in. bushings.....	.07	.14
1	4 in. orifice flange with plate and connections.....		48.00
2	4 in. x 3 in. swedge nipples.....	1.57	3.14
1	3 in. x 3 in. low pressure Chaplin-Fulton regulator.....		126.00
1	4 in. Crane low pressure valve, No. 6.....		13.70
1	8 in. x 4 in. swedge nipple.....		6.37
1	8 in. light cast iron tee.....		9.15
1	8 in. plug.....		2.23
1	8 in. x 2 in. Dresser saddle.....		4.40
2	2 in. tees.....	.44	.88
4	2 in. elbows.....	.33	1.32
1	2 in. flange union.....		.81
2	2 in. nipples.....	.16	.32
1	2 in. Dresser coupling.....		1.26
1	2 in. brass stop cock.....		3.35
1	2 in. high pressure gate valve.....		14.00
1	2 in. x 1 in. Dresser saddle.....		1.22
1	2 in. plug.....		.08
1	8 in. oil seal tank with connections.....		20.00
30 ft.	2 in. pipe.....	.24	7.20
15 ft.	4 in. pipe.....	.62	9.30
2 ft.	$2\frac{1}{2}$ in. pipe.....	.15	.30
3 ft.	8 in. pipe.....	1.50	4.50
1	2 in. high pressure Darling gate valve.....		14.00
2	2 in. nipples.....	.16	.32
1	2 in. heavy cast elbow.....		.58
1	2 in. flange union.....		.81
1	2 in. plug.....		.08
4 ft.	2 in. pipe.....	.24	.96
	3 in. main connection.....		24.00
	Building, 10 ft. x 16 ft. x 8 ft. (fair).....		92.20
	Total.....		\$654.60
OUTSIDE REGULATOR HOUSE			
1	4 in. x 2 in. heavy cast tee.....		\$4.45
4	4 in. nipples.....	\$0.72	2.88

BLENHEIM REGULATOR STATION—*Continued*

Quantity	Item	Unit new	Reproduction cost new
1	4 in. Crane high pressure gate valve.....		\$26.10
2	4 in. Dresser couplings.....	\$1.93	3.86
1	4 in. high pressure separator drip.....		121.29
2	4 in. nipples.....	.72	1.44
1	4 in. heavy cast elbow.....		2.68
40 ft.	8 in. line pipe.....	1.50	60.00
14 ft.	2 in. line pipe.....	.24	3.36
1	2 in. nipple.....		.16
1	2 in. heavy cast elbow.....		.58
9 ft.	4 in. line pipe.....	.62	5.58
	Chamber.....		5.00
1	Set Foxboro recording gauges.....		276.00
	Labour, cartage, and miscellaneous.....		135.00
	Total.....		\$1,302.98

BLENHEIM No. 2 REGULATOR STATION

2	Building, 8 ft. x 11 ft. x 8 ft.....		\$42.70
1	2 in. heavy cast tees.....	\$0.73	1.46
1	2 in. plug.....		.08
1	2 in. high pressure Darling valve.....		14.00
1	2 in. Dresser coupling.....		1.26
3	2 in. nipples.....	.16	.48
1	2 in. low pressure Chaplin-Fulton regulator.....		71.80
1	3 in. x 2 in. swedge nipple.....		1.18
1	3 in. malleable tee.....		1.10
1	3 in. light cast tee.....		1.00
1	3 in. Crane high pressure valve.....		18.60
2	3 in. nipples.....	.43	.86
2	3 in. plugs.....	.20	.40
2 ft.	3 in. pipe.....	.44	.88
5 ft.	2 in. pipe.....	.24	1.20
	Labour, cartage, and miscellaneous.....		17.00
	Total.....		\$174.00

CEDAR SPRINGS REGULATOR STATION

9 ft.	2 in. pipe.....	\$0.24	\$2.16
3 ft.	2 in. pipe.....	.24	.72
1	2 in. heavy cast tee.....		.73
1	2 in. Darling high pressure valve.....		14.00
1	2 in. brass stop cock.....		3.35
1	2 in. x 1 in. bushing.....		.11
1	1 in. x ½ in. bushing.....		.05
1	Pressure gauge, 5 in., 100 pounds, and connections.....		7.00
12	2 in. nipples.....	.16	1.92
2	2 in. flange unions.....	.81	1.62
4	2 in. street elbows.....	.37	1.48
7	2 in. elbows.....	.33	2.31
3	2 in. tees.....	.44	1.32

CEDAR SPRINGS REGULATOR STATION—*Continued*

Quantity	Item	Unit cost	Reproduction cost, new
1	2 in. plug.....		\$0.08
2	3 in. x 2 in. swedge nipples.....	\$1.18	2.36
1	3 in. malleable tee.....		1.10
1	3 in. malleable elbow.....		.81
1	2 in. heavy cast elbow.....		.58
2	No. 4 Tobey meters.....	117.50	235.00
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
1	5 lb. Mercury gauge and connection.....		4.50
5 ft.	3 in. outlet pipe.....	.44	2.20
	Oil seal U type.....		15.00
	Building, 5 ft. x 9 ft. x 7 ft., corrugated iron on wood frame (fair).....		32.80
	Labour, cartage, and miscellaneous.....		40.00
	Total.....		\$443.00

RIDGETOWN No. 1 REGULATOR

INVENTORY FROM THE STREET TO THE MAIN REGULATOR HOUSE			
1	8 in. high pressure gate valve.....		\$81.00
2	8 in. Dresser couplings.....	\$3.42	6.84
1	8 in. x 2 in. x 8 in. welded tee.....		20.30
1	2 in. brass stop cock.....		3.35
1	3 in. x 2 in. swedge nipple.....		1.18
1	3 in. Dresser coupling.....		1.67
1	3 in. heavy cast elbow.....		1.53
1	3 in. heavy cast tee.....		2.43
1	3 in. Dresser coupling.....		1.67
3	3 in. nipples.....	.43	1.29
1	8 in. x 6 in. Y.....		18.20
1	8 in. No. 125 Jenkins valve.....		46.30
1	6 in. valve.....		29.20
1	6 in. plug.....		1.00
1	6 in. heavy cast elbow.....		6.12
1	8 in. heavy cast elbow.....		13.00
1	8 in. heavy cast tee.....		20.30
1	6 in. Kerr valve.....		26.00
1	8 in. x 6 in. swedge nipple.....		5.48
1	6 in. plug.....		1.00
2	8 in. x 4 in. swedge nipples.....	6.37	12.74
1	4 in. Ludlow No. 8 valve.....		40.15
1	4 in. high pressure regulator.....		160.00
1	4 in. nipple.....		.72
2	8 in. x 3 in. Dresser saddles.....	5.33	10.66
1	3 in. Ludlow valve, No. 8.....		27.59
1	3 in. heavy cast elbow.....		1.53
1	3 in. Dresser coupling.....		1.67
4	3 in. nipples.....	.43	1.72
2	3 in. x 1 in. Dresser saddles.....	1.50	3.00
1	1 in. nipple.....		.07
	Small fittings.....		3.00
1	3 in. light Crane valve.....		10.00

RIDGETOWN No. 1 REGULATOR—Continued

Quantity	Item	Unit cost	Reproduction cost new
1	3 in. malleable cast elbow.....		\$0.81
7 ft.	8 in. pipe, high pressure.....	\$1.50	10.50
28 ft.	8 in. low pressure pipe.....	1.50	42.00
12 ft.	8 in. low pressure pipe.....	1.50	18.00
28 ft.	3 in. high pressure pipe.....	.44	12.32
1	5 ft. x 4 ft. x 4 ft. cover over high pressure regulator....		14.70
1	Second hand boiler, dust trap.....		30.00
	Total.....		\$689.04
MAIN REGULATOR HOUSE			
	Building, 14 ft. 4 in. x 10 ft. x 8 ft. (new).....		\$80.80
1	8 in. orifice flange, plate and connections.....		59.00
1	8 in. light cast tee.....		9.15
1	8 in. x 4 in. swedge nipple.....		6.37
1	8 in. x 3 in. swedge nipple.....		7.27
1	4 in. high pressure valve.....		26.10
2	4 in. nipples.....	\$0.72	1.44
1	4 in. low pressure Chaplin-Fulton regulator with dash pot and connection.....		190.50
1	8 in. x 4 in. swedge nipples.....		6.37
1	8 in. Pratt & Cady valve, low pressure.....		46.30
1	8 in. light cast elbow, low pressure.....		6.27
3	8 in. nipples.....	3.60	10.80
1	8 in. x 4 in. light cast tee.....		9.15
1	8 in. elbow.....		6.27
1	4 in. Dresser coupling.....		1.93
1	4 in. light cast tee.....		1.62
1	4 in. plug.....		.34
1	4 in. U oil seal welded and connection.....		12.00
1	3 in. x 1 in. saddle.....		1.50
1	Columbia pressure recording gauge and connection.....		68.00
1	Foxboro recording gauge and connection.....		276.00
1	3 in. heavy cast tee.....		2.43
1	3 in. light gate valve.....		11.20
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. low pressure valve.....		8.00
1	3 in. elbow.....		.81
2	3 in. nipples.....	.43	.86
1	3 in. Dresser coupling.....		1.67
18 ft.	8 in. pipe.....	1.50	27.00
11 ft.	3 in. pipe.....	.44	4.84
	Labour, cartage, and miscellaneous.....		180.00
	Total.....		\$1,754.21

RIDGETOWN REGULATOR (WATER AND YORK)

	Building, 11 ft. x 8 ft. x 5 ft., corrugated iron roof, wood sides, fair.....		\$44.50
1	3 in. heavy cast elbow.....		1.53
1	3 in. heavy cast tee.....		2.43
1	3 in. heavy cast plug.....		.20

RIDGETOWN REGULATOR (WATER AND YORK)—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	3 in. high pressure Darling valve.....		\$22.60
3	3 in. nipples.....	\$0.43	1.29
1	3 in. Chaplin-Fulton low pressure regulator.....		126.00
1	3 in. low pressure gate valve.....		11.20
2	3 in. malleable elbows.....	.81	1.62
9 ft.	3 in. pipe.....	.44	3.96
10 ft.	3 in. pipe.....	.44	4.40
1	Mercury gauge with fittings.....		4.50
	Main connection.....		24.00
	Labour, cartage, and miscellaneous.....		30.00
	Total.....		\$278.23

RIDGETOWN REGULATOR (CUNNINGHAM STREET)

	Building, 11 ft. x 8 ft. x 5 ft., corrugated roof, wood sides.....		\$44.50
2	3 in. heavy cast elbows.....	\$1.53	3.06
3	3 in. heavy cast tees.....	2.43	7.29
3	3 in. plugs.....	.20	.60
1	3 in. high pressure Darling valve.....		22.60
1	3 in. low pressure gate valve.....		11.20
4	3 in. nipples.....	.43	1.72
1	3 in. Chaplin-Fulton low pressure regulator.....		126.00
1	Mercury gauge with fittings.....		4.50
16 ft.	3 in. pipe.....	.44	7.04
	Main connection.....		24.00
	Labour, cartage, and miscellaneous.....		30.00
	Total.....		\$282.51

TILBURY REGULATOR NO. 2 (ELLA STREET)

	Building, 9 ft. 6 in. x 12 ft. x 6 ft. (good).....		\$59.50
5	4 in. heavy cast elbows.....	\$2.68	13.40
4	4 in. x 2 in. heavy cast tees.....	4.45	17.80
3	4 in. Crane valves, high pressure.....	26.10	78.30
10	4 in. nipples.....	.72	7.20
2	2 in. Crane valves, high pressure.....	14.00	28.00
2	2 in. brass stop cocks.....	3.35	6.70
2	2 in. heavy cast elbows.....	.58	1.16
3	2 in. malleable street elbows.....	.37	1.11
1	2 in. malleable elbow.....		.33
8	2 in. nipples.....	.16	1.28
2	2 in. Dresser couplings.....	1.26	2.52
1	2 in. x 1 in. saddle.....		1.22
1	8 in. x 4 in. saddle.....		6.72
1	4 in. x 2 in. saddle.....		2.02
1	4 in. Chaplin-Fulton high pressure regulator.....		160.00
1	4 in. Chaplin-Fulton low pressure regulator.....		160.00
2	8 in. x 4 in. heavy cast reducers.....	5.50	11.00
1	Oil seal and connections, tank lap welded.....		20.00
1	Pressure gauge and connection.....		7.00

TILBURY REGULATOR No. 2 (ELLA STREET)—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	Mercury gauge and connection.....		\$4.50
3 ft.	8 in. pipe.....	\$1.50	4.50
7 ft.	2 in. pipe.....	.24	1.68
16 ft.	4 in. pipe.....	.62	9.92
56 ft.	4 in. high pressure pipe, outside.....	.62	34.72
60 ft.	4 in. intermediate pressure pipe, outside.....	.62	37.20
61 ft.	4 in. intermediate pressure pipe, outside.....	.62	37.82
	Labour, cartage, and miscellaneous.....		97.00
	Total.....		\$812.60

TILBURY REGULATOR No. 1 (CANAL STREET)

1	3 in. heavy cast ells.....		\$1.15
1	3 in. nipple.....		.43
1	10 in. x 3 in. welded swedge nipple.....		10.00
1	10 in. x 2 in. welded swedge nipple.....		10.00
1	4 in. to 10 in. welded connection.....		3.00
1	2 in. to 10 in. welded connection.....		2.00
2	4 in. light cast tees.....	\$1.62	3.24
2	4 in. light cast ells.....	1.13	2.26
1	4 in. plug.....		.34
1	4 in. Jenkins No. 125 gate valve.....		15.20
1	3 in. Jenkins No. 125 gate valve.....		11.20
1	2 in. high pressure Pratt & Cody gate valve.....		18.40
1	4 in. Chaplin-Fulton high pressure regulator.....		160.00
1	4 in. Chaplin-Fulton low pressure regulator.....		160.00
1	14 in. dash pot.....		30.50
8	4 in. nipples.....	.72	5.76
2	4 in. x 3 in. swedge nipples.....	1.57	3.14
1	3 in. light cast flange union.....		1.22
3	3 in. light cast ells.....	.69	2.07
2	3 in. nipples.....	.43	.86
1	4 in. orifice flange, plate and connection.....		48.00
1	4 in. x 2 in. light cast tee.....		1.62
1	8 in. x 3 in. swedge nipple.....		8.00
1	8 in. x 4 in. light cast tee.....		9.15
1	8 in. heavy cast ell.....		13.00
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. light cast flange union.....		.81
4	2 in. malleable ells.....	.33	1.32
2	2 in. nipples.....	.16	.32
1	4 in. x 1 in. saddle.....		1.73
1	1 in. brass stopcock.....		1.03
2	1 in. nipples.....		.14
1	Mercury gauge and connection.....	.07	4.50
1	5 in. pressure gauge and connection.....		7.00
14 ft.	2 in. pipe screw.....	.24	3.36
145 ft.	3 in. pipe, screw.....	.44	63.80
21 ft.	4 in. pipe, screw.....	.62	13.02
80 ft.	10 in. pipe, Dresser coupling.....	1.94+5.00	175.60
55 ft.	8 in. pipe, Dresser coupling.....	1.45+3.42	90.00
140 ft.	6¾ in. pipe, Dresser coupling.....	.90+3.00	147.00

TILBURY REGULATOR No. 1 (CANAL STREET)—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	8 in. light cast tee.....		\$9.15
1	8 in. x 6 in. swedge nipple.....		5.48
1	8 in. x 4 in. swedge nipple.....		6.37
1	6 in. light cast tee.....		3.70
2	6 in. x 4 in. swedge nipples.....	\$2.93	5.86
1	Set Foxboro gauges and connection.....		276.00
2	Bristol recording gauges and connection.....	68.00	136.00
132 ft.	½ in. pipe lines to gauges.....	.05	6.60
55 ft.	1 in. pipe to dash pot.....	.10	5.50
	Labour, team, and miscellaneous.....		180.00
	Total.....		\$1,666.01

RIVER ROAD, NORTHERN REGULATOR

2	2 in. heavy cast elbows.....	\$0.58	\$1.16
2	2 in. x 1 in. tees.....	.44	.88
1	2 in. light gate valve.....		8.00
9	2 in. nipples.....	.16	1.44
1	1½ in. Emco high pressure regulator.....		71.00
2	1½ in. nipples.....	.10	.20
2	2 in. x 1½ in. reducers.....	.25	.50
3	2 in. street elbows.....	.37	1.11
2	2 in. malleable elbows.....	.33	.66
1	2 in. lip union.....		.53
1	2 in. Crawford sensitive regulator.....		39.50
1	2½ in. x 2 in. reducer.....		.50
1	No. 25 Westinghouse meter.....		214.50
5 ft.	2 in. pipe.....	.24	1.20
1	Bristol recording gauge, 7 days.....		68.00
	Meter house 7 ft. x 4 ft. x 4 ft.....		18.60
	Labour, team, and miscellaneous.....		37.00
	Total.....		\$464.78

PRAIRIE SIDING LOW PRESSURE REGULATOR

1	2 in. brass stop cock.....		\$3.35
4	2 in. nipples.....	\$0.16	.64
2	2 in. lip union.....	.53	1.06
1	3 in. x 2 in. swedge nipple.....		1.18
2	3 in. cast iron elbows.....	1.53	3.06
1	3 in. nipple.....		.43
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
	2 in. main connection.....		10.50
	Labour, team, and miscellaneous.....		15.00
	Total.....		\$107.02

RIVER ROAD LOW PRESSURE REGULATOR, FROM NORTHERN LINE,
WEST SIDE

Quantity	Item	Unit cost	Reproduction cost new
1	2 in. brass stop cock.....		\$3.35
2	2 in. nipples.....	\$0.16	.32
1	2 in. lip union.....		.53
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
	Labour, team, and miscellaneous.....		12.00
	Total.....		\$88.00

No. 3 PUMP, TILBURY EAST

REGULATOR HOUSE			
2	3 in. elbows.....	\$0.69	\$1.38
1	2 in. high pressure valve.....		14.00
4	2 in. nipples.....	.16	.64
1	2 in. heavy cast tee.....		.73
2	2 in. flange union, heavy cast.....	1.22	2.44
1	2 in. x ½ in. bushing.....		.11
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. Chaplin-Fulton high pressure regulator.....		71.80
2	8 in. x 2 in. light cast reducers.....	5.50	11.00
4 ft.	8 in. pipe.....	1.50	6.00
6	2 in. nipples.....	.16	.96
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
1	Mercury gauge and connection.....		4.50
1	3 in. heavy flange union.....		1.82
5	3 in. nipples.....	.43	2.15
1	3 in. high pressure Darling valve.....		22.60
2	3 in. malleable tees.....	1.10	2.20
1	3 in. x 1 in. bushing.....		.23
1	3 in. plug.....		.20
1	pipe tank, oil seal and connection.....		20.00
1	Pressure gauge and connection.....		7.00
	Old shed, in use occasionally.....		
8	2 in. brass stop cocks.....	3.35	26.80
4	Tobey meters, No. 4.....	117.50	470.00
9	2 in. nipples.....	.16	1.44
16	2 in. street elbows, malleable.....	.37	5.92
8	4 in. x 2 in. saddles.....	2.02	16.16
1	2 in. flange union.....		1.22
32 ft.	4 in. pipe.....	.62	19.84
1	3 in. high pressure Darling valve.....		22.60
	Labour, cartage, and miscellaneous.....		99.00
	Total.....		\$905.72

No. 2 PUMP, TILBURY EAST, DRAIN

Quantity	Item	Unit cost	Reproduction cost new
	Oil seal pipe tank and connection		\$20.00
1	3 in. heavy cast tee		2.43
1	3 in. x 2 in. swedge nipple		1.18
1	2 in. high pressure Darling gate valve		14.00
1	2 in. cast tee .....		.73
1	2 in. brass stop cock		3.35
2	2 in. flange unions	\$1.22	2.44
5	2 in. nipples .....	.16	.80
1	2 in. x 1½ in. bushing .....		.11
1	2 in. Chaplin-Fulton high pressure regulator		71.80
2	8 in. x 2 in. light cast reducers	5.50	11.00
4 ft.	8 in. pipe	1.50	6.00
1	2 in. light pressure Chaplin-Fulton regulator		71.80
1	Mercury gauge and connection		4.50
1	Pressure gauge and connection		7.00
1	3 in. flange union		1.82
3	3 in. nipples .....	.43	1.29
1	3 in. high pressure Darling gate valve		22.60
1	3 in. malleable tee		1.10
1	3 in. x 1 in. bushing .....		.23
1	4 in. x 3 in. swedge nipple		1.57
1	4 in. light cast elbow		1.13
6	2 in. brass stop cocks	3.35	20.10
8	4 in. x 2 in. saddles	2.02	16.16
6	2 in. malleable elbows .....	.33	1.98
6	2 in. street elbows .....	.37	2.22
6	2 in. nipples .....	.16	.96
16 ft.	4 in. pipe .....	.62	9.92
5 ft.	4 in. pipe .....	.62	3.10
3	Tobey meters, No. 4	117.50	352.50
14 ft.	2 in. pipe .....	.24	3.36
1	2 in. cast elbow .....		.58
1	2 in. flange union		1.22
2	4 in. plugs .....	.34	.68
	Labour, cartage, and miscellaneous		70.00
	Total		\$729.66

JEANNETTE CREEK REGULATOR STATION

2	2 in. cast elbows	\$0.58	\$1.16
1	2 in. heavy cast tee .....		.73
1	2 in. high pressure Darling gate valve		14.00
12	2 in. nipples .....	.16	1.92
1	2 in. flange union		1.22
1	2 in. x 1 in. saddle		1.22
1	2 in. cast stop cock, brass core		3.14
1	2 in. Dresser coupling		1.26
1	2 in. lip union .....		.53
3	2 in. malleable elbows .....	.33	.99
1	2 in. tee .....		.73
1	2 in. street elbow .....		.37
5	3 in. nipples .....	.43	2.15
1	3 in. Darling gate valve		14.20
2	3 in. light cast elbows .....	.69	1.38

JEANNETTE CREEK REGULATOR STATION—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	3 in. heavy cast tee.....		\$2.43
1	3 in. light flange union.....		1.22
1	U oil seal and connections.....		15.00
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
1	Mercury gauge and connection.....		4.50
2	3 in. heavy cast elbows.....	\$1.53	3.06
2	3 in. x 2 in. swedge nipples.....	1.18	2.36
2	2 in. malleable elbows.....	.33	.66
1	No. 4 Tobey meter.....		117.50
	House, 4 ft. x 6 ft. x 5 ft. (new).....		19.80
	Labour, cartage, and miscellaneous.....		37.00
	Total.....		\$320.33

No. 1 PUMP, TILBURY EAST

1	3 in. light cast tee.....		\$1.00
1	3 in. Ludlow valve No. 8.....		27.59
1	3 in. heavy cast tee.....		2.43
2	3 in. plugs.....	\$0.20	.40
1	3 in. x 2 in. swedge nipples.....		1.18
1	2 in. heavy cast tee.....		.73
1	2 in. x ½ in. bushing.....		.11
1	2 in. high pressure Darling gate valve.....		14.00
6	2 in. nipples.....	.16	.96
2	2 in. heavy flange unions.....	1.22	2.44
1	2 in. Chaplin-Fulton high pressure regulator.....		71.80
2	8 in. x 2 in. light cast reducers.....	5.50	11.00
4 ft.	8 in. pipe.....	1.50	6.00
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
8	3 in. nipples.....	.43	2.64
1	3 in. high pressure Darling gate valve.....		22.60
1	3 in. heavy flange union.....		1.82
1	3 in. malleable tee.....		1.10
1	3 in. malleable elbow.....		.81
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. light cast tee.....		.38
1	Pipe oil seal with connection.....		20.00
1	Mercury gauge with connection.....		4.50
1	Pressure gauge and connection.....		7.00
	House, 14 ft. x 8 ft. x 7 ft., wood.....		65.00
3	No. 4 Tobey meters.....	117.50	352.50
8	4 in. x 2 in. saddles.....	2.02	16.16
2	2 in. plugs.....	.08	.16
6	2 in. brass stop cocks.....	3.35	20.10
12	2 in. street elbows, malleable.....	.37	4.44
6	2 in. nipples.....	.16	.96
1	4 in. light cast elbow.....		1.13
1	4 in. plug.....		.34
34 ft.	4 in. pipe.....	.62	21.08
	Labour, cartage, and miscellaneous.....		75.00
	Total.....		\$830.34

ST. JOACHIM REGULATOR HOUSE

Quantity	Item	Unit cost	Reproduction cost, new
3	2 in. heavy cast elbows.....	\$0.58	\$1.74
3	2 in. heavy cast tees.....	.73	2.19
9	2 in. malleable tees.....	.44	3.96
4	2 in. plugs.....	.08	.32
2	2 in. high pressure Darling gate valves.....	14.00	28.00
1	2 in. high pressure Crane gate valve.....		14.00
5	2 in. brass stop cocks.....	3.35	16.75
3	2 in. flange unions.....	1.22	3.66
23	2 in. nipples.....	.16	3.68
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
1	2 in. low pressure Chaplin-Fulton regulator.....		71.80
2	2 in. x 1 in. bushings.....	.11	.22
1	1 in. lip union.....		.23
1	1 in. brass stop cock.....		1.03
3	No. 4 Tobey meters.....	117.50	352.50
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connections.....		20.00
25 ft.	2 in. pipe.....	.24	6.00
8 ft.	1 in. pipe.....	.10	.80
	Building, 9 ft. x 12 ft. x 8 ft., built 1912; roof, corrugated iron on wood (bad).....		71.00
	Main connection.....		10.50
	Labour, cartage, and miscellaneous.....		65.00
	Total.....		\$749.68

DEERBROOK REGULATOR

2	Young B regulators.....	\$35.00	\$70.00
1	1 in. brass stop cock.....		1.03
2	1 in. nipples.....	.07	.14
1	1 in. ell.....		.17
1	1½ in. nipple.....		.10
1	1½ in. lip union.....		.41
	Labour, cartage, and miscellaneous.....		10.80
	Total.....		\$82.65

RUSCOMB REGULATOR

3	2 in. malleable ells.....	\$0.33	\$0.99
5	2 in. malleable tees.....	.44	2.20
2	2 in. heavy cast tees.....	.73	1.46
3	2 in. plugs.....	.08	.24
2	2 in. Darling high pressure gate valves.....	14.00	28.00
2	2 in. heavy cast flange unions.....	1.22	2.44
2	2½ in. x 2 in. malleable reducer.....	.25	.50
15	2 in. nipples.....	.16	2.40
1	2 in. Chaplin-Fulton high pressure regulator.....		71.80
1	Young B regulator.....		35.00
1	2 in. x 1 in. malleable reducer.....		.25
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. x 1½ in. bushing.....		.11

RUSCOMB REGULATOR—*Continued.*

Quantity	Item	Unit cost	Reproduction cost new
1	1½ in. nipple.....		\$0.10
1	1 in. brass stop cock.....		1.03
3	1 in. nipples.....	\$0.07	.21
1	1 in. lip union.....		.23
1	1 in. malleable street ell.....		.19
4	2 in. malleable street ells.....	.38	1.52
1	No. 25 Westinghouse meter.....		214.50
1	No. 4 Tobey meter.....		117.50
1	Bristol recording gauge and connection.....		68.00
1	Pressure gauge and connection.....		7.00
1	Mercury gauge and connection.....		4.50
30 ft.	2 in. pipe.....	.24	7.20
126 ft.	2 in. pipe, high pressure line.....	.24	30.24
156 ft.	3 in. pipe, low pressure line.....	.44	68.64
156 ft.	2 in. pipe, intermediate pressure line.....	.24	37.44
	Building, 8 ft. x 12 ft., corrugated iron (fair).....		60.00
	Main connection.....		10.50
	Labour, team, and miscellaneous.....		82.00
	Total.....		\$857.37

REGULATOR AT COMBER CONNECTION, WINDSOR LINE
(1912)

2	3 in. Ludlow gate valves, No. 8.....	\$27.59	\$55.18
2	3 in. heavy cast elbows.....	1.53	3.06
1	3 in. heavy cast tees.....		2.43
2	3 in. x 2 in. swedge nipples.....	1.18	2.36
2	2 in. heavy cast tees.....	.73	1.46
3	2 in. heavy cast elbows.....	.58	1.74
2	2 in. brass stop cocks.....	3.35	6.70
7	2 in. nipples.....	.16	1.12
2	2 in. x 1½ in. reducers.....	.25	.50
1	1½ in. lip union.....		.41
3	1½ in. nipples.....	.10	.30
1	2 in. x 1 in. saddle.....		1.22
1	1½ in. Field regulator.....		31.50
2	2 in. x 1 in. bushing.....	.11	.22
1	1 in. Dresser coupling.....		.63
1	1 in. brass stop cock.....		1.03
56 ft.	3 in. pipe to Windsor line.....	.44	24.64
47 ft.	3 in. pipe to Windsor line.....	.44	20.68
	3 in. main connection.....		24.00
	Labour, cartage, and miscellaneous.....		27.00
	Total.....		\$206.18

COMBER REGULATOR

2	3 in. heavy cast elbows.....	\$1.53	\$3.06
1	3 in. x 2 in. heavy cast tee.....		2.43
1	2 in. heavy cast elbow.....		.58
1	3 in. high pressure O.W.S. gate valve.....		27.59
1	2 in. high pressure O.W.S. gate valve.....		18.42

COMBER REGULATOR—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
6	3 in. nipples.....	\$0.43	\$2.58
1	3 in. high pressure Chaplin-Fulton regulator.....		126.00
1	3 in. heavy flange union.....		1.82
1	6 in. x 3 in. swedge nipple.....		3.32
1	6 in. x 3 in. light cast tee.....		3.70
1	6 in. nipple.....		1.74
1	6 in. x 8 in. low pressure regulator.....		269.00
4	8 in. nipples.....	3.60	14.40
2	8 in. light cast tees.....	9.15	18.30
1	8 in. plug.....		2.23
1	6 in. x 3 in. light cast tee.....		3.70
1	8 in. No. 125 Jenkins gate valve.....		46.30
1	2 in. brass stop cock.....		3.35
1	2 in. Dresser coupling.....		1.26
5	2 in. nipples.....	.16	.80
1	2 in. x 1 1/4 in. saddle.....		1.28
1	Pressure gauge and connection.....		7.00
1	Mercury gauge and connection.....		4.50
1	Pipe tank oil seal and connection.....		20.00
6 ft.	2 in. pipe.....	.24	1.44
22 ft.	8 in. pipe.....	1.50	33.00
6 ft.	3 in. pipe.....	.44	2.64
	Building, 16 ft. x 10 ft. x 7 ft.; all wood, rubberoid roof, fair.....		80.60
	Hut, 8 ft. x 10 ft. x 7 ft., corrugated iron, good.....		53.10
	Labour, cartage, and miscellaneous.....		90.00
	Total.....		\$844.14

FARMERS' PUMP

1	3 in. high pressure Ludlow No. 8 gate valve.....		\$27.59
1	3 in. heavy cast elbow.....		1.53
2	3 in. x 2 in. swedge nipples.....	\$1.18	2.36
1	2 in. heavy pressure Darling gate valve.....		14.00
1	2 in. heavy cast tee.....		.73
1	2 in. heavy cast ell.....		.58
1	3 in. nipple.....		.43
1	3 in. high pressure Chaplin-Fulton regulator.....		126.00
1	3 in. heavy cast tee.....		2.43
1	3 in. x 2 in. bushing.....		.23
1	2 in. heavy flange union.....		1.22
8	2 in. nipples.....	.16	1.28
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
1	2 in. light flange union.....		.81
2	Pressure gauges and connections.....	7.00	14.00
1	Mercury gauge and connections.....		4.50
1	Riveted tank oil seal and connections.....		20.00
5	2 in. brass stop cocks.....	3.35	16.75
2	2 in. malleable elbows.....	.33	.66
8	2 in. malleable street elbows.....	.37	2.96
4	3 in. x 2 in. saddles.....	2.03	8.12
2	3 in. plugs.....	.20	.40
2	No. 4 Tobey meters.....	117.50	235.00

FARMERS' PUMP—Continued

Quantity	Item	Unit cost	Reproduction cost new
39 ft.	3 in. high pressure line.....	\$0.44	\$17.16
12 ft.	2 in. high pressure line.....	.24	2.88
	Labour, cartage, and miscellaneous.....		68.00
	Total.....		\$641.42

RIVER ROAD, RALEIGH, OFF SARNIA LINE

3	1½ in. malleable elbows.....	\$0.21	\$0.63
2	1½ in. x 1 in. malleable tees.....	.33	.66
2	1½ in. Crane brass stop cocks.....	2.24	4.48
11	1½ in. nipples.....	.10	1.10
2	1½ in. ground seat flange unions.....	1.80	3.60
1	1½ in. Field regulator.....		31.50
1	1½ in. plug.....		.06
2	1 in. malleable elbows.....	.16	.32
1	1 in. Crane brass stop cock.....		1.03
1	1 in. tee.....		.22
1	1 in. ground seat flange union.....		.70
6	1 in. nipples.....	.07	.42
1	2 in. x 1½ in. malleable reducer.....		.25
7	2 in. nipples.....	.16	1.12
1	2 in. lip union.....		.53
1	2 in. Crawford sensitive regulator.....		39.50
1	2 in. x 1 in. tee.....		.44
2	2½ in. x 2 in. bushings.....	.16	.32
3	2 in. elbows.....	.33	.99
1	2 in. street elbow.....		.37
1	2 in. malleable tee.....		.44
1	2 in. high pressure Darling gate valve.....		14.00
1	2 in. low pressure Crane gate valve.....		8.00
1	No. 25 Westinghouse meter.....		214.50
1	Bristol recording gauge and connection.....		68.00
10 ft.	2 in. pipe in box.....	.24	2.40
	Meter box.....		5.00
	1½ in. main connection.....		7.00
	Labour, cartage, and miscellaneous.....		35.00
	Total.....		\$442.58

PAINCOURT LOW PRESSURE REGULATOR

4	2 in. heavy cast ells.....	\$0.58	\$2.32
2	2 in. heavy cast tees.....	.73	1.46
2	2 in. high pressure Jenkins gate valves.....	14.00	28.00
1	2 in. x 1 in. saddle.....		1.22
8	2 in. nipples.....	.16	1.28
1	2 in. flange union.....		.81
2	3 in. x 2 in. swedge nipples.....	1.18	2.36
9	3 in. nipples.....	.43	3.87
1	3 in. low pressure Chaplin-Fulton regulator.....		126.00
1	3 in. x 2 in. heavy cast tee.....		2.43

PAINCOURT LOW PRESSURE REGULATOR—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	3 in. light cast tee.....		\$1.00
1	3 in. low pressure Crane gate valve.....		10.00
4	3 in. malleable elbows.....	\$0.81	3.24
1	4 in. x 3 in. swedge nipple.....		1.57
2	2 in. malleable elbows.....	.33	.66
2	2 in. malleable street elbows.....	.37	.74
1	2½ in. x 2 in. malleable reducer.....		.50
1	3 in. x 2½ in. malleable reducer.....		.60
1	3 in. light cast ell.....		.69
1	No. 25 Westinghouse meter.....		214.50
1	8 in. pipe oil seal and connection.....		20.00
1	Bristol recording gauge and connections.....		68.00
1	Pressure gauge and connection.....		7.00
1	Mercury gauge and connection.....		4.50
4 ft.	3 in. pipe.....	.44	1.76
18 ft.	2 in. pipe.....	.24	4.32
	Building, 14 ft. x 5 ft. x 6 ft., wood.....		47.60
	Labour, cartage, and miscellaneous.....		56.00
	Total.....		\$612.43

PAINCOURT HIGH PRESSURE REGULATOR

2	2 in. heavy cast ells.....	\$0.58	\$1.16
2	2 in. heavy cast tees.....	.73	1.46
1	2 in. x 1 in. saddle.....		1.22
2	2 in. O.W.S. high pressure gate valves.....	18.42	36.84
5	2 in. nipples.....	.16	.80
2	2 in. x 1½ in. malleable reducers.....	.25	.50
2	1½ in. ground seat flange unions.....	1.80	3.60
4	1½ in. nipples.....	.10	.40
1	1½ in. high pressure Emco regulator.....		71.00
1	2 in. x 1 in. malleable reducer.....		.25
3	1 in. brass stop cocks.....	1.03	3.09
1	1 in. Dresser coupling.....		.63
2	1 in. street elbows malleable.....	.19	.38
4	1 in. nipples.....	.07	.28
1	1 in. malleable elbow.....		.16
1	2 in. x 1½ in. bushing.....		.11
8 ft.	2 in. pipe.....	.24	1.92
4 ft.	1 in. pipe.....	.10	.40
	Building, 6 ft. x 8 ft. x 5 ft., wood.....		30.00
	2 in. main connection.....		10.50
	Labour, cartage, and miscellaneous.....		14.00
	Total.....		\$178.70

CONCESSION IV, DOVER UNION LINE, WEST OF PAINCOURT

1	10 in. x 1 in. saddle.....		\$5.45
4	1 in. nipples.....	\$0.07	.28
2	1 in. elbows.....	.16	.32
1	1 in. street elbow.....		.19
1	1 in. brass stop cock.....		1.03

CONCESSION IV, DOVER, UNION LINE—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	Young B regulator.....		\$35.00
1	1½ in. nipple.....		.10
1	2 in. x 1½ in. bushing.....		.11
1	2 in. x 1 in. malleable tee.....		.44
2	2 in. malleable elbows.....	\$0.33	.66
2	2 in. nipples.....	.16	.32
1	No. 4 Tobey meter.....		117.50
	Meter box, 3 ft. x 5 ft.....		7.00
	Labour, cartage, and miscellaneous.....		17.00
	Total.....		\$185.40

CONCESSION IV, DOVER NORTHERN

1	6 in. x 1 in. saddle.....		\$2.82
2	1 in. brass stop cocks.....	\$1.03	2.06
11	1 in. nipples.....	.07	.77
4	1 in. malleable elbows.....	.16	.64
2	1 in. lip unions.....	.23	.46
4	1 in. malleable street elbows.....	.19	.76
1	1 in. Field Emco regulator.....		22.50
1	1 in. Crawford sensitive regulator.....		28.00
2	1 in. x ½ in. tee.....	.22	.44
2	2 in. x 1 in. malleable reducers.....	.25	.50
1	No. 4 Tobey meter.....		117.50
4 ft.	1 in. pipe.....	.10	.40
2	Meter boxes.....		6.00
	Labour, cartage, and miscellaneous.....		20.00
	Total.....		\$202.85

TOWN LINE, DOVER EAST AND WEST REGULATOR

4	1½ in. malleable elbows.....	\$0.21	\$0.84
2	1½ in. x 1 in. malleable tees.....	.33	.66
2	1½ in. brass stop cocks.....	2.24	4.48
2	1½ in. ground seat flange unions.....	1.80	3.60
10	1½ in. nipples.....	.10	1.00
1	1½ in. Emco high pressure regulator.....		71.00
2	1 in. brass stop cocks.....	1.03	2.06
1	1 in. ground seat flange union.....		.70
2	1 in. street elbows.....	.19	.38
5	1 in. nipples.....	.07	.35
1	Pressure gauge and connection.....		7.00
	1½ in. main connection.....		7.00
	Labour, cartage, and miscellaneous.....		9.00
	Total.....		\$108.07

HIGH PRESSURE REGULATOR ON TILBURY LINE, NEAR WINDSOR LINE

Quantity	Item	Unit cost	Reproduction cost new
4	3 in. heavy cast ells.....	\$1.53	\$6.12
2	3 in. high pressure Ludlow No. 8 gate valves.....	27.59	55.18
1	3 in. high pressure Chaplin-Fulton regulator.....		126.00
6	3 in. nipples.....	.43	2.58
2	3 in. x 2 in. heavy cast tees.....	2.43	4.86
2	2 in. heavy cast ells.....	.58	1.16
1	2 in. Dresser coupling.....		1.26
6	2 in. nipples.....	.16	.96
1	2 in. brass stop cock.....		3.35
1	2 in. high pressure Crane gate valve.....		14.00
5 ft.	3 in. pipe.....	.44	2.20
	3 in. main connection.....		24.00
	Labour, cartage, and miscellaneous.....		36.00
	Total.....		\$277.67

BELLE RIVER REGULATOR HOUSE

1	3 in. heavy cast ell.....		\$1.53
4	3 in. heavy cast tees.....	\$2.43	9.72
1	3 in. plug.....		.20
2	3 in. high pressure Darling gate valves.....	22.60	45.20
5	3 in. nipples.....	.43	2.15
3	3 in. x 2 in. bushings.....	.23	.69
2	2 in. cast iron stop cocks with brass core.....	3.14	6.28
3	2 in. tees.....	.44	1.32
2	2 in. plugs.....	.08	.16
1	2 in. high pressure flange union.....		1.22
4	2 in. nipples.....	.16	.64
1	2 in. x 1 in. bushing.....		.11
1	3 in. Chaplin-Fulton high pressure regulator.....		126.00
1	3 in. Chaplin-Fulton low pressure regulator.....		126.00
1	3 in. heavy cast flange union.....		1.82
4 ft.	3 in. pipe.....	.44	1.76
8 ft.	2 in. pipe.....	.24	1.92
12 ft.	2 in. pipe.....	.24	2.88
1	Mercury gauge and connection.....		4.50
1	Oil seal pipe and connection.....		20.00
1	8 in. elbow.....		6.27
1	8 in. x 3 in. swedge nipple.....		7.27
	Building, 12 ft. x 10 ft. x 6 ft., corrugated iron on wood frame (fair).....		61.40
	Labour, cartage and miscellaneous.....		56.00
	Total.....		\$485.04

OFF BELLE RIVER LINE

1	Young B regulator.....		\$35.00
	Fittings.....		1.85
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		6.50
	Total.....		\$48.35

NORTH WOODSLEE REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
3	2 in. heavy cast tees.	\$0.73	\$2.19
2	2 in. plugs. ....	.08	.16
2	2 in. high pressure Darling gate valves.	14.00	28.00
3	2 in. flange unions.	1.22	3.66
13	2 in. nipples. ....	.16	2.08
4	2 in. malleable tees. ....	.44	1.76
1	2 in. x 1 in. bushing. ....		.11
1	2 in. Chaplin-Fulton high pressure regulator.		71.80
1	2 in. Chaplin-Fulton low pressure regulator.		71.80
1	2 in. brass stop cock.		3.35
1	U oil seal complete with fittings.		15.00
1	Mercury gauge with connections.		4.50
1	Wooden building, 10 ft. x 5 ft. x 6 ft. 6 in.		39.50
	2 in. main connection.		10.50
	Labour, cartage, and miscellaneous.		35.00
	Total.		\$289.41

SOUTH WOODSLEE REGULATOR

1	2 in. heavy cast tee.		\$0.73
4	2 in. malleable tees.	\$0.40	1.76
3	2 in. plugs. ....	.08	.24
2	2 in. Crane gate valve, high pressure.	14.00	28.00
1	2 in. flange union.		1.22
6	2 in. nipples. ....	.16	.96
2	3 in. x 2 in. swedge nipples.	1.18	2.36
1	3 in. Chaplin-Fulton high pressure regulator.		126.00
1	3 in. Chaplin-Fulton low pressure regulator.		126.00
3	3 in. nipples. ....	.43	1.29
3	3 in. light cast tees.	1.00	3.00
1	3 in. x 2 in. bushing. ....		.23
7 ft.	3 in. pipe. ....	.44	3.08
11 ft.	2 in. pipe. ....	.24	2.64
1	3 in. Jericka gate valve.		11.20
1	3 in. plug. ....		.20
1	8 in. pipe oil seal and connection.		20.00
1	Mercury gauge with connection.		4.50
28 ft.	Building, 8 ft. x 12 ft. x 6 ft., corrugated iron, wood frame.		53.70
	2 in. high pressure pipe. ....	.24	6.72
	Labour, cartage, and miscellaneous.		51.00
	Total.		\$444.83

SOUTH WOODSLEE BRICKYARD REGULATOR

1	2 in. high pressure Crane gate valve.		\$14.00
1	2 in. high pressure Darling gate valve.		14.00
2	2 in. heavy cast tees.	\$0.73	1.46
4	2 in. malleable tees. ....	.44	1.76
1	3 in. x 2 in. malleable tees.		1.10
1	2 in. plug. ....		.08
1	2 in. heavy cast flange union.		1.22

SOUTH WOODSLEE BRICKYARD REGULATOR—Continued

Quantity	Item	Unit cost	Reproduction cost new
1	2 in. light cast flange union.....		\$0.81
1	1 in. lip union.....		.23
3	2 in. x 1 in. bushings.....	\$0.11	.33
9	2 in. nipples.....	.16	1.44
1	3 in. x 2 in. swedge nipple.....		1.18
1	3 in. malleable elbow.....		.81
1	½ in. brass stop cock.....		.45
2	1 in. brass stop cock.....	1.03	2.06
1	2 in. heavy cast stop with brass core.....		3.14
1	2 in. low pressure Chaplin-Fulton regulator.....		71.80
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
1	No. 4 Tobey meter.....		117.50
1	Meter box, 8 ft. x 4 ft.....		28.10
1	8 in. pipe oil seal complete with connections.....		20.00
6 ft.	1 in. pipe.....	.10	.60
10 ft.	2 in. pipe.....	.24	2.40
16 ft.	3 in. pipe.....	.44	7.04
	Labour, cartage, and miscellaneous.....		42.00
	Total.....		\$405.31

HIGH PRESSURE REGULATOR ON BELLE RIVER LINE

1	3 in. Chaplin-Fulton high pressure regulator.....		\$126.00
1	Pressure gauge and connection.....		7.00
	3 in. main connection.....		24.00
	Small fittings.....		3.00
	Labour, cartage, and miscellaneous.....		24.00
	Total.....		\$184.00

HIGH PRESSURE REGULATOR ON ESSEX LINE, OFF WINDSOR LINE

4	3 in. heavy cast tees.....	\$2.43	\$9.72
3	3 in. nipples.....	.43	1.29
2	3 in. x 2 in. bushings.....	.23	.46
2	2 in. plugs.....	.08	.16
1	3 in. high pressure Chaplin-Fulton regulator.....		126.00
2	3 in. plugs.....	.20	.40
	3 in. main connection.....		24.00
	Labour, cartage, and miscellaneous.....		24.00
	Total.....		\$186.03

JESSOP LINE AND DUMONCHELLE LINE, ON MIDDLE ROAD, OFF WINDSOR LINE

2	Farmer connections.....		
2	1 in. Field regulators.....	\$22.50	\$45.00
2	No. 1 Tobey meters.....	14.70	29.40
	Fittings.....		3.00
2	1 in. main connections.....	5.00	10.00
	Labour, cartage, and miscellaneous.....		16.00
	Total.....		\$103.40

ESSEX No. 1 REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
	Building, 16 ft. x 10 ft. x 6 ft., corrugated iron.....		\$75.50
16 ft.	8 in. pipe.....	\$1.50	24.00
4 ft.	6 in. pipe.....	1.10	4.40
1	2 in. gate valve O.W.S.....		18.42
2	3 in. heavy cast tees.....	2.43	4.86
1	3 in. plug.....		.20
5	3 in. nipples.....	.43	2.15
1	3 in. x 2 in. swedge nipple.....		1.18
1	3 in. Ludlow gate valve No. 8, high pressure.....		27.59
1	2 in. Crane high pressure gate valve.....		14.00
1	2 in. brass stop cock.....		3.35
2	2 in. malleable tees.....	.44	.88
1	2 in. Dresser coupling.....		1.26
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
1	3 in. x 4 in. low pressure Chaplin-Fulton regulator.....		126.00
1	4 in. Jericka low pressure gate valve.....		15.20
1	4 in. x 2 in. swedge nipple.....		1.88
1	4 in. x 2 in. bushing.....		.38
2	4 in. light cast tees.....	1.62	3.24
4	4 in. nipples.....	.72	2.88
1	6 in. x 4 in. swedge nipple.....		2.93
1	6 in. light cast elbow.....		2.55
2	2 in. x 1 in. bushings.....	.11	.22
1	8 in. pipe oil seal tank and connections.....		20.00
1	Mercury gauge and connections.....		4.50
4 ft.	3 in. pipe.....	.44	1.76
8 ft.	2 in. pipe.....	.24	1.92
	Labour, cartage, and miscellaneous.....		53.00
	Total.....		\$486.05

REGULATOR* AT SCHOOL, ESSEX

(Not in use)

1	2 in. heavy cast tee.....		\$0.73
3	2 in. malleable tees.....	\$0.44	1.32
4	2 in. plugs.....	.08	.32
1	2 in. high pressure Crane gate valve.....		14.00
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
1	3 in. low pressure Chaplin-Fulton regulator.....		126.00
2	3 in. x 2 in. swedge nipples.....	1.18	2.36
1	2 in. nipple.....		.16
1	2 in. cast iron stop cock, brass core.....		3.14
16 ft.	2 in. pipe.....	.24	3.84
	Building.....		
	Total.....		\$223.67

*This regulator is not in use, and it is usual to omit such items in appraisals for rate-making.

No. 2 ESSEX REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
2	3 in. heavy cast tees.....	\$2.43	\$4.86
2	3 in. plugs.....	.20	.40
1	3 in. Jenkins No. 125 gate valve.....		11.20
1	3 in. x 1 in. saddle.....		1.50
1	3 in. x 4 in. Chaplin-Fulton low pressure regulator.....		126.00
1	4 in. Darling gate valve.....		15.20
1	4 in. malleable tee.....		1.85
1	4 in. malleable elbow.....		1.93
1	4 in. Dresser coupling.....		1.93
1	4 in. x 3 in. bushing.....		.38
1	3 in. x 2 in. bushing.....		.23
2	3 in. nipples.....	.43	.86
3	4 in. nipples.....	.72	2.16
1	2 in. x 1 in. bushing.....		.11
3 ft.	3 in. pipe.....	.44	1.32
	Building, 6 ft. x 8 ft. x 7 ft.....		39.40
1	Young B regulator, Arthur street.....		35.00
	Fittings.....		1.85
	Labour, cartage, and miscellaneous.....		32.00
	Total.....		\$278.18

MAIDSTONE REGULATOR

3	2 in. heavy cast tees.....	\$0.73	\$2.19
2	2 in. plugs.....	.08	.16
1	2 in. light cast tee.....		.38
3	2 in. malleable tees.....	.44	1.32
3	2 in. malleable elbows.....	.33	.99
4	2 in. flange unions.....	.81	3.24
2	2 in. high pressure Darling gate valves.....	14.00	28.00
16	2 in. nipples.....	.16	2.56
2	2 in. x 1 in. bushing.....	.11	.22
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
1	2 in. low pressure Chaplin-Fulton regulator.....		71.80
1	2 in. Dresser coupling.....		1.26
1	1 in. brass stop cock.....		1.03
1	1 in. Dresser coupling.....		.63
1	8 in. pipe oil seal and connection.....		20.00
6 ft.	8 in. pipe cushion.....		13.00
2	8 in. x 2 in. cast iron reducer.....	5.50	11.00
1	2 in. plug.....		.08
1	Mercury gauge and connection.....		4.50
6 ft.	2 in. pipe.....	.24	1.44
8 ft.	1 in. pipe.....	.10	.80
	Building, 8 ft. x 10 ft. x 6 ft.....		47.30
	Labour, cartage, and miscellaneous.....		36.00
	Total.....		\$319.70

MAIDSTONE LINE, OFF WINDSOR LINE

Quantity	Item	Unit cost	Reproduction cost new
3	2 in. heavy cast tees.....	\$0.73	\$2.19
3	2 in. plugs.....	.08	.24
1	2 in. high pressure Crane gate valve.....		14.00
6	2 in. nipples.....	.16	.96
1	2 in. high pressure flange union.....		1.22
2	2 in. malleable elbows.....	.33	.66
1	2 in. malleable tee.....		.44
1	2 in. x 1 in. bushing.....		.11
1	1 in. brass stop cock.....		1.03
1	2 in. Chaplin-Fulton high pressure regulator.....		71.80
5 ft.	2 in. pipe.....	.24	1.20
	Meter box, 5 ft. x 3 ft. x 3 ft.....		10.00
	2 in. main connection.....		10.50
	Labour, cartage, and miscellaneous.....		15.00
	Total.....		\$129.35

WINDSOR REGULATOR STATION

1	10 in. elbow.....		\$23.60
1	10 in. x 4 in. saddle.....		9.90
1	4 in. nipple.....		.72
1	4 in. Ludlow No. 8 gate valve.....		40.15
19 ft.	10 in. pipe.....	\$2.00	38.00
1	10 in. gate valve, Ludlow high pressure.....		307.30
8 ft. 6 in.	10 in. pipe.....	2.00	17.00
1	10 in. x 4 in. heavy cast tee.....		34.00
2	4 in. nipples.....	.72	1.44
1	4 in. gate valve.....		40.15
1	4 in. elbow.....		2.30
1	8 in. x 4 in. swedge nipple.....		6.37
31 ft.	8 in. pipe.....	1.50	46.50
1	8 in. x 2 in. swedge nipple.....		9.07
2	2 in. stop cocks.....	3.35	6.70
2	2 in. nipples.....	.16	.32
2	2 in. elbows.....	.38	.76
7 ft.	2 in. pipe.....	.24	1.68
1	2 in. plug.....		.08
8 ft. 6 in.	10 in. pipe.....	2.00	17.00
1	10 in. x 1 in. saddle.....		5.45
5 ft.	10 in. riser.....	2.00	10.00
1	10 in. heavy cast tee.....		34.00
1	10 in. heavy cast elbow.....		23.60
1	10 in. x 8 in. swedge nipple.....		8.47
2	8 in. elbows.....	13.00	26.00
2 ft.	8 in. pipe.....	1.50	3.00
45 ft.	8 in. pipe to drip.....	1.50	67.50
1	8 in. x 2 in. swedge nipple.....		9.07
2	2 in. stop cocks.....	3.35	6.70
2	2 in. nipples.....	.16	.32
7 ft.	2 in. pipe.....	.24	1.68
2 ft. 10 in.	10 in. pipe.....	2.00	5.65
1	10 in. x 8 in. heavy cast cross.....		45.00
1	8 in. x 3 in. swedge nipple.....		7.27

WINDSOR REGULATOR STATION—Continued.

Quantity	Item	Unit cost	Reproduction cost new
1	3 in. plug.....		\$0.20
3 ft.	10 in. pipe.....	\$2.00	6.00
1	10 in. Ludlow high pressure valve.....		307.30
3 ft. 1 in.	10 in. pipe.....	2.00	6.20
1	10 in. Dresser line sleeve.....		13.70
4 ft.	10 in. pipe.....	2.00	8.00
2	18 in. Dresser couplings.....	9.45	18.90
2	18 in. welded end plugs.....	12.75	25.50
282 ft.	18 in. pipe, welded.....	{ 4.50 6.00	1,353.00
2	18 in. Dresser couplings.....	9.45	18.90
2	18 in. welded end plugs.....	12.75	25.50
22 ft. 8 in.	10 in. pipe.....	2.00	45.34
10 ft.	10 in. pipe on east end.....	2.00	20.00
2 ft. 6 in.	10 in. pipe.....	2.00	5.00
1	10 in. Dresser line sleeve.....		13.70
110 ft. 8 in.	10 in. welded pipe.....		245.33
2 ft.	10 in. pipe welded to line.....		8.00
1 ft.	10 in. pipe welded to line.....		6.00
18 ft. 3 in.	13 in. pipe welded to line.....	3.25	64.31
1 ft. 2 in.	8 in. pipe welded to line.....		5.15
1	8 in. Jenkins high pressure gate valve.....		81.00
10 ft. 6 in.	8 in. pipe.....	1.50	15.75
1	8 in. orifice flange, plate and connection.....		59.00
5 ft. 1 in.	8 in. pipe.....	1.50	7.62
1	8 in. Dresser line sleeve.....		11.20
5 ft. 6 in.	8 in. pipe.....	1.50	8.25
1	8 in. Kerr high pressure valve.....		81.00
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1	8 in. Jenkins No. 125 valve.....		46.30
8 in.	8 in. pipe.....	1.50	1.00
9 ft. 10 in.	12 in. pipe.....	3.00	30.00
1	12 in. orifice flange, plate and connection.....		96.00
10 ft.	12 in. pipe.....	3.00	30.00
8 in.	8 in. pipe.....	1.50	1.00
1	8 in. Jenkins valve.....		46.30
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1	8 in. Jenkins No. 125 valve.....		46.30
10 ft. 7 in.	8 in. pipe.....	1.50	15.80
1	8 in. orifice flange, plate and connection.....		59.00
5 ft. 3 in.	8 in. pipe.....	1.50	7.90
1	8 in. Dresser line sleeve.....		11.20
5 ft. 5 in.	8 in. pipe.....	1.50	8.20
1	8 in. Kerr No. 6 gate valve.....		81.00
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1	8 in. x 4 in. swedge nipple.....		6.37
1	4 in. plug.....		.34
2	8 in. Dresser collar leak clamps.....	3.34	6.68
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1	8 in. pipe bull plug.....		9.00
2	8 in. Dresser collar leak clamps.....	3.34	6.68

WINDSOR REGULATOR STATION—Continued

Quantity	Item	Unit cost	Reproduction cost new
1	8 in. nipple.....		\$3.60
1	8 in. Ludlow high pressure gate valve.....		140.89
1 ft. 2 in.	8 in. pipe.....	\$1.50	1.75
1	8 in. orifice flange, plate and connections.....		59.00
5 ft. 4 in.	8 in. pipe.....	1.50	8.00
1	8 in. Dresser line sleeve.....		11.20
6 ft. 3 in.	8 in. pipe.....	1.50	9.40
1	8 in. Ludlow high pressure valve.....		140.89
1	8 in. nipple.....		3.60
18 ft. 10 in.	13 in. welded steel pipe.....		66.21
2 ft. 2 in.	10 in. welded steel pipe.....		8.84
1	10 in. x 1 in. saddle.....		5.45
1	10 in. Dresser line sleeve.....		13.70
2 ft.	10 in. pipe.....	2.00	4.00
1	10 in. x 8 in. cross, heavy cast.....		45.00
1	8 in. x 3 in. swedge nipple.....		7.27
1	3 in. Dresser coupling.....		1.67
2 ft. 8 in.	10 in. pipe.....	2.00	5.34
1	10 in. x 4 in. saddle.....		9.90
5 ft.	10 in. pipe.....	2.00	10.00
1	10 in. heavy cast elbow.....		22.68
25 ft.	10 in. pipe to fence outlet.....	2.00	54.00
1	10 in. x 4 in. saddle.....		9.90
1	4 in. nipple.....		.72
1	4 in. Ludlow gate valve.....		40.15
1	4 in. plug.....		.34
15 ft.	10 in. pipe to road.....	2.00	30.00
ON ORIGINAL LINE TO TECUMSEH			
1 ft. 3 in.	4 in. pipe.....	.62	.77
1	4 in. light cast elbow.....		1.13
2 ft. 2 in.	4 in. pipe.....	.62	1.35
1	4 in. Dresser line sleeve.....		3.90
2	4 in. nipples.....	.72	1.44
1	4 in. Darling gate valve.....		20.40
1	4 in. light cast elbow.....		1.13
5 ft.	4 in. pipe.....	.62	3.10
1	5½ in. x 4 in. swedge nipple.....		3.82
1	4 in. elbow.....		2.30
21 ft. 6 in.	5½ in. pipe.....	.71	15.27
IN BUILDING			
15 ft.	13 in. pipe.....	3.25	48.75
15 ft.	13 in. pipe.....	3.25	48.75
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1	8 in. Jenkins gate valve.....		46.30
1 ft. 6 in.	8 in. pipe.....	1.50	2.25
1	8 in. Chaplin-Fulton regulator.....		400.00
2 ft. 3 in.	8 in. pipe.....	1.50	3.40
1	8 in. Jenkins No. 125 gate valve.....		46.30
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1	2 in. nipple.....		.16
1	2 in. Darling gate valve.....		8.20
1	2 in. plug.....		.08

WINDSOR REGULATOR STATION—Continued

Quantity	Item	Unit cost	Reproduction cost new
1 ft. 2 in.	8 in. pipe.....	\$1.50	\$1.75
1	8 in. Pratt & Cady gate valve.....		46.30
2 ft. 8 in.	8 in. pipe.....	1.50	4.00
1	8 in. Dresser line sleeve.....		11.20
2 ft. 6 in.	8 in. pipe.....	1.50	3.75
1	8 in. Pratt & Cady gate valve.....		46.30
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1	8 in. Jenkins No. 125 gate valve.....		46.30
1 ft. 5 in.	8 in. pipe.....	1.50	2.20
1	8 in. high pressure Chaplin-Fulton regulator.....		400.00
2 ft. 5 in.	8 in. pipe.....	1.50	3.60
1	8 in. Jenkins high pressure gate valve.....		81.00
1 ft. 2 in.	8 in. pipe.....	1.50	1.75
1	Pressure gauge and connection.....		7.00
	Wood building, 18 ft. 4 in. x 14 ft. 4 in. x 10 ft.....		140.00
2	Sets Foxboro gauges and connections.....	276.00	552.00
1	Pressure recording gauge and connection.....		68.00
	Labour, cartage, and miscellaneous.....		890.00
1	8 in. drip.....		158.00
	Total.....		\$7,680.37

GRAND MARIS ROAD AND HOWARD AVENUE, MAIN CONNECTION

4	4 in. light cast ells.....	\$1.13	\$4.52
4	4 in. nipples.....	.72	2.88
1	4 in. high pressure Chaplin-Fulton regulator.....		160.00
1	Pressure gauge and connection.....		7.00
	House, 5 ft. x 5 ft. x 5 ft.....		20.00
	4 in. main connections.....		44.50
	Labour, cartage, and miscellaneous.....		32.00
	Total.....		\$270.90

WINDSOR STREET LINE, MAIN CONNECTION

1	10 in. x 4 in. saddle.....		\$9.90
1	4 in. high pressure gate valve.....		26.10
4	4 in. nipples.....	\$0.72	2.88
2	4 in. ells, heavy cast.....	2.68	5.36
	Labour, cartage, and miscellaneous.....		7.00
	Total.....		\$51.24

TECUMSEH LINE REGULATOR, AT PILETTE'S CORNER

Quantity	Item	Unit cost	Reproduction cost new
1	4 in. x 1 in. saddle.....		\$1.73
1	1 in. brass stop cock.....		1.03
1	1 in. union.....		.42
2	1 in. nipples.....	\$0.07	.14
1	2 in. x 1 in. bushing.....		.11
1	2 in. street malleable elbow.....		.37
2	2 in. Darling gate valves.....	14.00	28.00
5	2 in. nipples.....	.16	.80
1	2 in. malleable ells.....		.33
1	2 in. low pressure Chaplin-Fulton regulator.....		71.80
1	No. 4 Tobey meter.....		117.50
2	Boxes.....		6.00
1	5½ in. x 2 in. saddle.....		3.12
2	2 in. nipples.....	.16	.32
2	2 in. ells.....	.33	.66
	Building, 18 ft. x 12 ft. x 7 ft., corrugated iron (fair).....		100.00
	Labour, cartage, and miscellaneous.....		19.00
	Total.....		\$351.33

TECUMSEH LOW PRESSURE REGULATOR

2	6 in. light cast ells.....	\$2.55	\$5.10
1	6 in. x 4 in. swedge nipple.....		2.93
1	4 in. x 2 in. heavy cast tees.....		4.45
3	4 in. nipples.....	.72	2.16
1	4 in. cast iron elbow.....		1.13
1	4 in. Jenkins No. 125 gate valve.....		15.20
7	2 in. nipples.....	.16	1.12
3	2 in. cast iron tees.....	.38	1.14
1	2 in. flange union.....		.81
1	2 in. cast iron stop cock, brass core.....		3.14
1	2 in. Darling high pressure gate valve.....		14.00
1	4 in. x 6 in. Chaplin-Fulton low pressure regulator.....		160.00
1	6 in. light cast tee.....		3.70
1	6 in. x 2 in. cast iron tee.....		3.70
1	6 in. No. 125 Jenkins gate valve.....		29.20
3	6 in. nipples.....	1.74	5.22
1	6 in. x 2 in. swedge nipple.....		3.98
1	2 in. malleable tee.....		.44
1	2 in. x 1 in. bushing.....		.11
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
11 ft.	6¼ in. pipe.....	.80	8.80
	18 ft. x 12 ft. x 7 ft. corrugated iron building.....		100.00
	Labour, cartage, and miscellaneous.....		45.00
	Total.....		\$435.83

DOVER METER HOUSE

Quantity	Item	Unit cost	Reproduction cost new
3	3 in. heavy cast ells.....	\$1.15	\$3.45
3	3 in. high pressure gate valves.....	18.60	55.80
3	4 in. x 3 in. swedge nipples.....	1.57	4.71
2	3 in. nipples.....	.43	.86
1	4 in. high pressure gate valve.....		26.10
2	4 in. heavy cast ells.....	2.30	4.60
1	4 in. nipple.....		.72
1	8 in. x 3 in. saddle.....		5.33
1	8 in. high pressure gate valve.....		81.00
3	8 in. welded ells.....	8.00	24.00
1	8 in. orifice flange complete with connection and plate.....		59.00
2	4 in. orifice flanges complete with connection and plate.....		48.50
17 ft.	4 in. pipe.....	.62	10.54
46 ft.	8 in. pipe.....	1.50	69.00
9 ft.	3 in. pipe.....	.44	3.96
3	Sets Foxboro gauges, float type, complete with connection	276.00	828.00
	Building, 8 ft. 6 in. x 10 ft. x 7 ft.....		55.04
	Labour, team, and miscellaneous.....		85.00
	Total.....		\$1,365.61

FARMERS' LINE, CONCESSION VII, DOVER

1	No. 4 Tobey meter.....		\$117.50
1	1 in. Field regulator.....		22.50
1	1 in. Crawford sensitive regulator.....		28.00
1	Bristol record gauge and connection.....		68.00
	1 in. main connection.....		5.00
1	1 in. stop cock.....		1.03
7	1 in. nipples.....	\$0.07	.49
2	1 in. lip unions.....	.23	.46
4	1 in. ells.....	.27	1.08
2	2 in. x 1 in. malleable reducers.....	.25	.50
	Labour, cartage, and miscellaneous.....		25.00
	Total.....		\$269.56

FARMERS' CONNECTION ON 9TH CONCESSION ROAD

1	1 in. Field high pressure regulator.....		\$22.50
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
1	No. 4 Tobey meter.....		117.50
1	2 in. Ludlow high pressure gate valve.....		18.42
4	2 in. malleable elbows.....	\$0.33	1.32
2	2 in. malleable street elbows.....	.37	.74
4	2 in. nipples.....	.16	.64
	1 in. main connection.....		5.00
	Building, 4 ft. x 5 ft. x 5 ft.....		17.60
	Labour, cartage, and miscellaneous.....		25.00
	Total.....		\$280.52

11TH CONCESSION LINE, DOVER CENTRE

Quantity	Item	Unit cost	Reproduction cost new
1	1 1/4 in. Emco high pressure regulator.....		\$154.00
1	No. 4 Tobey meter.....		117.50
1	2 in. Chaplin-Fulton regulator.....		71.80
	1 1/4 in. main connection.....		6.00
	Building, 6 ft. x 6 ft. x 5 ft.....		24.46
1	1 1/4 in. brass stop cock.....		1.55
4	1 1/4 in. nipples.....	\$0.09	.36
2	1 1/4 in. lip unions.....	.30	.66
1	2 in. x 1 1/4 in. malleable reducer.....		.25
4	2 in. nipples.....	.16	.64
1	2 in. high flange union.....		.81
	Labour, cartage, and miscellaneous.....		22.00
	Total.....		\$299.97

No. 3 NORTHERN REGULATOR

1	1 in. high pressure Emco regulator.....		\$42.60
1	No. 4 Tobey meter.....		117.50
1	1 in. brass stop cock.....		1.03
7	2 in. nipples.....	\$0.07	.49
4	1 in. ells.....	.16	.64
	Box.....		5.00
	1 in. main connection.....		5.00
2	2 in. x 1 in. malleable reducers.....	.25	.50
2	1 in. lip unions.....	.23	.46
	Labour, cartage, and miscellaneous.....		15.00
	Total.....		\$188.22

SHREWSBURY LINE, OR COMMUNICATION ROAD

1	2 in. heavy cast elbow.....		\$0.58
2	2 in. heavy cast tees.....	\$0.73	1.46
1	2 in. plug.....		.08
5	2 in. nipples.....	.16	.80
1	2 in. x 1 in. bushing.....		.11
1	2 in. x 1 1/4 in. malleable reducer.....		.25
2	2 in. high pressure Darling gate valves.....	14.00	28.00
2	1 1/4 in. lip unions.....	.30	.60
5	1 1/4 in. nipples.....	.09	.45
2	1 1/4 in. x 1 in. malleable reducers.....	.09	.18
1	1 1/4 in. high pressure Emco regulator.....		54.00
1	2 in. Crawford sensitive regulator.....		39.50
8	2 in. malleable elbows.....	.33	2.64
2	2 in. malleable tees.....	.44	.88
1	2 in. x 1 in. malleable tee.....		.44
11	2 in. nipples.....	.16	1.76
1	2 in. malleable street elbow.....		.37
1	2 in. brass stop cock.....		3.35
1	2 in. flange union.....		.81
2	No. 4 Tobey meters.....	117.50	235.00

SHREWSBURY LINE, OR COMMUNICATION ROAD—Continued

Quantity	Item	Unit cost	Reproduction cost new
1	30 lb. Bristol recording gauge and connections.....		\$68.00
10 ft.	2 in. pipe.....	\$0.24	2.40
	Boxes, 4 ft. x 5 ft. x 5 ft. and 6 ft. x 2 ft. x 2 ft.....		24.00
	2 in. main connection.....		10.50
	Labour, cartage, and miscellaneous.....		35.00
	Total.....		\$511.16

SHREWSBURY LOW PRESSURE REGULATOR

1	2 in. brass stop cock.....		\$3.35
5	2 in. malleable elbows.....	\$0.33	1.65
9	2 in. nipples.....	.16	1.44
1	2 in. cast flange union.....		.81
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
1	2 in. malleable tee.....		.44
1	2 in. malleable street elbow.....		.37
1	2 in. lip union.....		.53
1	No. 4 Tobey meter.....		117.50
1	3 in. x 2 in. swedge nipple.....		1.18
1	U oil seal and connection.....		15.00
	New box, 6 ft. x 4 ft. x 4 ft.....		16.00
	Labour, cartage, and miscellaneous.....		25.00
	Total.....		\$255.07

REGULATOR ON RONDEAU LINE, TALBOT ROAD

1	2 in. malleable elbow.....		\$0.33
1	2 in. x 1½ in. malleable reducer.....		.25
2	1½ in. brass stop cock.....	\$2.24	4.48
1	1 in. brass stop cock.....		1.03
2	1½ in. malleable tees.....	.44	.88
2	1½ in. x 1 in. malleable reducer elbows.....	.24	.48
1	1½ in. street elbow.....		.24
8	1½ in. nipples.....	.10	.80
5	1 in. nipples.....	.07	.35
1	1 in. lip union.....		.23
2	1 in. x ¾ in. tees.....	.22	.44
1	1½ in. high pressure Emco regulator.....		71.00
	Box, 5 ft. x 1½ ft. x 1½ ft.....		4.00
	2 in. main connection.....		10.50
6	2 in. malleable elbows.....	.33	1.98
2	2 in. malleable tees.....	.44	.88
1	2 in. Empire brass stop cock.....		3.35
6	2 in. nipples.....	.16	.96
1	2 in. x 1 in. saddle.....		1.22
2	No. 4 Tobey meters.....	117.50	235.00
1	Bristol recording gauge.....		68.00
3 ft.	2 in. pipe.....	.24	1.92
	Box, 5 ft. x 4 ft. x 4 ft.....		14.00
	Labour, cartage, and miscellaneous.....		32.00
	Total.....		\$454.32

MORPETH REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
5	2 in. malleable tees.....	\$0.44	\$2.20
2	2 in. x 1 in. malleable tees.....	.44	.88
3	2 in. high pressure Darling gate valves.....	14.00	42.00
1	2 in. plug.....		.08
22	2 in. nipples.....	.16	3.52
2	2 in. flange unions.....	.81	1.62
1	2 in. Dresser coupling.....		1.26
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
1	2 in. low pressure Chaplin-Fulton regulator.....		71.80
1	2 in. brass stop cock.....		3.35
3	1 in. tees.....	.22	.66
1	1 in. lip union.....		.23
3	1 in. nipples.....	.07	.21
3	No. 4 Tobey meters.....	117.50	352.50
7	2 in. malleable elbows.....	.33	2.31
1	Mercury gauge and connection.....		4.50
1	8 in. pipe tank oil seal and connection.....		20.00
6 ft.	1 in. pipe.....	.10	.60
8 ft.	2 in. pipe.....	.24	1.92
	Building, 7 ft. x 12 ft. x 6 ft.....		45.00
	2 in. main connection.....		10.50
	Labour, cartage, and miscellaneous.....		66.00
	Total.....		\$702.94

MORPETH, TALBOT ROAD REGULATOR

1	No. 4 Tobey meter.....		\$117.50
1	Young B regulator.....		35.00
	Fittings.....		1.85
	Box.....		3.00
	Labour, cartage, and miscellaneous.....		16.00
	Total.....		\$173.35

MORPETH, ERIE STREET REGULATOR

1	No. 4 Tobey meter.....		\$117.50
1	Young B regulator.....		35.00
	Fittings.....		1.85
	Box.....		3.00
	Labour, cartage, and miscellaneous.....		16.00
	Total.....		\$173.35

GUILD'S FARMER LINE No. 2

1	High pressure Field regulator.....		\$22.50
1	1 in. Crawford low pressure regulator.....		28.00
1	No. 1 Tobey meter.....		14.70
1	1 in. ground seat flange union.....		.70
27 ft.	1 in. pipe.....	\$0.10	2.70

GUILD'S FARMER LINE No. 2--Continued.

Quantity	Item	Unit cost	Reproduction cost new
	Box.....		\$3.00
1	1 in. Chaplin-Fulton low pressure regulator.....		36.00
1	No. 1 Tobey meter.....		14.70
48 ft.	1 in. pipe.....	\$0.10	4.80
	Box.....		3.00
2	1 in. brass stop cocks.....	1.03	2.06
2	1 in. elbows.....	.16	.32
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		20.00
	Total.....		\$157.48

CONCESSION II, HARWICH, 6 INCH RIDGETOWN LINE

1	1 in. high pressure Field regulator.....		\$22.50
1	1 in. Young B regulator.....		35.00
2	No. 4 Tobey meters.....	\$117.50	235.00
3	1 in. brass stop cocks.....	1.03	3.09
2	2 in. x 1 in. malleable reducers.....	.25	.50
2	1 in. tees.....	.22	.44
1	1 in. x 1/2 in. tee.....		.44
11	1 in. nipples.....	.07	.77
2	1 in. lip unions.....	.23	.46
5	1 in. street elbows.....	.16	.80
1	1 1/2 in. x 1 in. bushing.....		.07
1	6 in. x 1 in. saddle.....		2.82
1	2 in. x 1 1/4 in. malleable reducer.....		.25
2	Boxes.....		7.00
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		32.00
	Total.....		\$346.14

CONCESSION III, FARMERS' LINES NORTH AND SOUTH

1	1 in. high pressure Field regulator.....		\$22.50
1	1 in. Crawford sensitive intermediate regulator.....		28.00
1	No. 4 Tobey meter.....		117.50
1	No. 1 Tobey meter.....		14.70
3	1 in. brass stop cocks.....	\$1.03	3.09
1	2 in. elbow.....		.33
1	2 in. x 1 1/4 in. bushing.....		.11
1	2 in. x 1 1/4 in. malleable reducer.....		.25
2	1 in. tees.....	.22	.44
2	1 in. lip unions.....	.23	.46
10	1 in. nipples.....	.07	.70
3	1 in. elbows.....	.16	.48
2	Boxes.....		7.00
12 ft.	1 in. pipe.....	.10	1.20
1	7-day Bristol recording gauge with connection.....		68.00
	1 in. main connection.....		5.00
	Labour, team, and miscellaneous.....		33.00
	Total.....		\$302.76

CONCESSION IV, FARMERS' NORTH

Quantity	Item	Unit new	Reproduc- tion cost new
1	1 in. Field regulator.....		\$22.50
1	No. 4 Tobey meter.....		117.50
1	2 in. x 1 1/4 in. malleable reducer.....		.25
1	2 in. x 1 in. malleable reducer.....		.25
1	1 in. tee.....		.22
1	1 in. x 1/2 in. tee.....		.22
3	1 in. malleable elbows.....	\$0.16	.48
3	1 in. lip unions.....	.23	.69
10	1 in. nipples.....	.07	.70
1	1 1/4 in. x 1 in. malleable reducer.....		.10
3	1 1/4 in. nipples.....	.09	.27
2	1 1/4 in. elbows.....	.20	.40
1	1 1/4 in. brass stop cock.....		1.55
	Box.....		3.00
	1 in. main connection.....		5.00
	Labour, team, and miscellaneous.....		15.00
	Total.....		\$168.13

CONCESSION IV, FARMERS' SOUTH

1	1 in. Field regulator.....		\$22.50
1	No. 4 Tobey meter.....		117.50
3	1 in. brass stop cocks.....	\$1.03	3.09
2	1 in. lip unions.....	.23	.46
2	1 in. tees.....	.22	.44
5	1 in. malleable elbows.....	.16	.80
11	1 in. nipples.....	.07	.77
2	2 in. x 1 1/2 in. bushings.....	.11	.22
1	1 1/4 in. nipple.....		.09
1	1 1/4 in. x 1 in. street elbow.....		.20
1	Bristol recording gauge and connection.....		68.00
	Box.....		4.00
61 ft.	1 in. pipe.....	.10	6.10
2	2 in. malleable elbows.....	.33	.66
	Fittings.....		2.00
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		27.00
	Total.....		\$258.83

GORE, FARMERS' NORTH

1	High pressure Field regulator.....		\$22.50
1	No. 1 Tobey meter.....		14.70
1	1 in. elbow.....		.16
1	1 in. brass stop cock.....		1.03
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		10.00
	Total.....		\$53.39

GORE, FARMERS' SOUTH

Quantity	Item	Unit cost	Reproduction cost new
1	1 in. high pressure Field regulator.....		\$22.50
1	2 in. Crawford sensitive regulator.....		28.00
1	No. 4 Tobey meter.....		117.50
2	2 in. x 1 in. malleable reducers.....	\$0.25	.50
4	1 in. malleable elbows.....	.16	.64
1	1 in. brass stop cock.....		1.03
10	1 in. nipples.....	.07	.70
2	1 in. x 1/2 in. tees.....	.22	.44
1	1 in. lip union.....		.23
66 ft.	1 in. pipe.....	.10	6.60
2	Boxes, 4 ft. x 4 ft. x 4 ft.....	10.00	20.00
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		20.00
	Total.....		\$223.14

McGUIGAN'S CONNECTION

1	1 in. Field high pressure regulator.....		\$22.50
1	1 in. Crawford sensitive regulator.....		28.00
1	No. 4 Tobey meter.....		117.50
2	1 in. brass stop cocks.....	\$1.03	2.06
4	1 in. malleable elbows.....	.16	.64
2	1 in. street elbows, malleable.....	.19	.38
2	2 in. x 1 in. malleable reducers.....	.25	.50
1	1 in. lip union.....		.23
30 ft.	1 in. pipe.....	.10	3.00
	Meter box.....		4.00
2	1 in. x 1/2 in. malleable tee.....	.22	.44
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		19.00
	Total.....		\$203.25

ERIE BEACH REGULATOR

42 ft.	1 in. pipe.....	\$0.10	\$4.20
1	1 in. Field high pressure regulator.....		22.50
1	No. 12 Westinghouse oil motor.....		107.00
1	1 in. brass stop cock.....		1.03
2	1 in. malleable elbows.....	.16	.32
1	1 in. lip union.....		.23
6	1 in. nipples.....	.07	.42
1	1 1/2 in. malleable reducer.....		.18
3	1 1/2 in. elbows, malleable.....	.21	.63
2	1 1/2 in. street elbows, malleable.....	.24	.48
1	1 1/2 in. nipple.....		.10
1	1 1/2 in. x 1 in. malleable reducer.....		.16
	Box.....		4.00
1	Bristol recording gauge and connection.....		68.00
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		23.00
	Total.....		\$237.25

CONCESSION III, VON SLAMBROOK LINE

Quantity	Item	Unit cost	Reproduction cost new
1	1½ in. brass stop cock.....		\$2.24
3	1½ in. malleable elbows.....	\$0.21	.63
2	1½ in. street elbows.....	.24	.48
1	1½ in. x 1 in. malleable reducer.....		.16
6	1½ in. nipples.....	.10	.60
1	1½ in. lip union.....		.41
1	1½ in. x 1 in. tee.....		.33
1	Young B regulator.....		35.00
2	1 in. nipples.....	.07	.14
	Labour, team, and miscellaneous.....		6.00
	Total.....		\$45.99

CEDAR SPRINGS, TALBOT ROAD REGULATOR

3	2 in. malleable elbows.....	\$0.33	\$0.99
1	2 in. x 1½ in. cast elbow.....		.38
1	2 in. high pressure gate valve.....		14.00
1	1½ in. high pressure Emco regulator.....		71.00
1	1½ in. lip union.....		.41
3	1½ in. nipples.....	.10	.30
1	2 in. x 1½ in. bushing.....		.11
1	Meter box.....		5.00
	2 in. main connection.....		10.50
	Labour.....		9.40
	Total.....		\$112.09

HIGH BANKS LINE, OFF TALBOT ROAD

	1 in. main connection.....		\$5.00
2	1 in. malleable elbows.....	\$0.16	.32
1	1 in. brass stop cock.....		1.03
8	1 in. nipples.....	.07	.56
1	1 in. high pressure Field regulator.....		22.50
1	1 in. Crawford sensitive regulator.....		28.00
2	1 in. x ½ in. tees.....	.22	.44
2	2 in. x 1 in. malleable reducers.....	.25	.50
1	No. 4 Tobey meter.....		117.50
2	Meter boxes.....		5.00
AT BEACH			
1	1 in. brass stop cock at Beach.....		1.03
1	1 in. tee.....		.22
1	1 in. plug.....		.03
3	1 in. nipples.....	.07	.21
1	1 in. lip union.....		.23
1	1¼ in. malleable elbow.....		.20
1	Young B regulator.....		35.00
3	1½ in. nipples.....	.10	.30
2	1½ in. lip unions.....	.41	.82
3	1½ in. street elbows.....	.24	.72
1	2 in. x 1½ in. reducer.....		.25
1	2 in. x 1½ in. bushing.....		.11
1	2 in. malleable tee.....		.44
	Labour, cartage, and miscellaneous.....		25.00
	Total.....		\$245.41

DR. CAMPBELL'S LINE

Quantity	Item	Unit cost	Reproduction cost new
	1 in. main connection.....		\$5.00
2	1 in. elbows.....	\$0.16	.32
1	1 in. brass stop cock.....		1.03
3	1 in. nipples.....	.07	.21
1	1 in. x ½ in. tee.....		.22
1	1¼ in. x 1 in. malleable reducer.....		.10
1	1½ in. x 1 in. bushing.....		.07
1	Young B regulator.....		35.00
1	No. 2 Tobey meter.....		28.80
	Box.....		3.00
	Labour, team, and miscellaneous.....		13.00
	Total.....		\$86.75

DR. HOLMES' LINE

1	1½ in. Emco regulator.....		\$71.00
1	No. 1 Tobey meter.....		14.70
1	1 in. brass stop cock.....		1.03
2	1 in. elbows.....	\$0.16	.32
2	1 in. nipples.....	.07	.14
	1 in. main connection.....		5.00
	Labour, team, and miscellaneous.....		10.00
	Total.....		\$102.19

RIDGETOWN LINE, METER AND REGULATOR STATION, TALBOT ROAD

IN BUILDING			
4	6 in. heavy cast elbows.....	\$6.12	\$24.48
1	6 in. heavy cast tee.....		6.47
1	6 in. plug.....		1.00
1	6 in. high pressure gate valve.....		46.50
1	6 in. No. 125 gate valve.....		29.20
2	6 in. high pressure Chaplin-Fulton regulators.....	269.00	538.00
1	6 in. x 4 in. Dresser saddle.....		5.62
2	4 in. heavy cast elbows.....	2.68	5.36
1	4 in. Jenkins gate valve, No. 125.....		15.20
6	6 in. nipples.....	1.74	10.44
1	8 in. x 6 in. swedge nipples.....		5.48
1	Set Foxboro pressure gauges and connection.....		276.00
2	Pressure gauges 200-300 and connection.....	7.00	14.00
STREET CONNECTION			
1	6 in. high pressure gate valve.....		46.50
1	6 in. nipple.....		1.74
2	6 in. heavy cast elbows.....	6.12	12.24
OUTSIDE BUILDING			
1	8 in. orifice meter, plate and connection.....		59.00
1	8 in. x 2 in. swedge nipple.....		9.07
1	2 in. heavy cast elbow.....		.58

RIDGETOWN LINE, METER AND REGULATOR STATION, TALBOT ROAD—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	2 in. O.W.S. gate valve.....		\$18.42
1	4 in. Dresser line sleeve.....		3.90
1	4 in. flange union.....		2.55
1	4 in. No. 125 Jenkins gate valve.....		15.20
1	4 in. heavy cast elbow.....		2.68
1	6 in. x 4 in. heavy cast tee.....		9.72
1	8 in. x 6 in. light cast elbow.....		6.27
1	6 in. Jenkins No. 125 gate valve.....		29.20
3	6 in. nipples.....	\$1.74	5.22
1	4 in. nipple.....		.72
1	6 in. heavy cast elbow.....		6.12
19 ft.	10 in. pipe.....	2.00	38.00
10 ft.	6 in. pipe.....	1.10	11.00
16 ft.	8 in. pipe.....	1.50	24.00
20 ft.	4 in. pipe.....	.62	12.40
36 ft.	6 in. pipe.....	1.10	39.60
	Wood building, 8 ft. x 10 ft. 6 in. x 7 ft.....		55.50
	Labour, team, and miscellaneous.....		150.00
	Total.....		\$1,537.38

QUEEN STREET EXTENSION, CHATHAM REGULATOR

1	1 in. elbow.....		\$0.16
1	1 in. brass stop cock.....		1.03
1	1 in. lip union.....		.23
3	1 in. nipples.....	\$0.07	.21
1	Young B regulator.....		35.00
1	1½ in. nipple.....		.10
1	2 in. x 1½ in. bushing.....		.11
1	2 in. x 1 in. malleable tee.....		.22
1	1 in. x ½ in. bushing.....		.05
1	Mercury gauge and connection.....		4.50
1	No. 4 Tobey meter.....		117.50
1	Box.....		4.00
1	2 in. tee.....		.44
1	2 in. x 1 in. bushing.....		.11
1	2 in. malleable elbow.....		.33
	1 in. main connection.....		5.00
	Labour, team and miscellaneous.....		20.00
	Total.....		\$188.99

HOUSTON STREET REGULATOR, NORTHWOOD SURVEY, CHATHAM

1	4 in. light cast elbow.....		\$1.13
1	4 in. cast tee.....		1.62
2	2 in. brass stop cocks.....	\$3.35	6.70
2	2 in. malleable elbows.....	.33	.66
6	2 in. nipples.....	.16	.96
2	2 in. Dart flange unions.....	1.70	3.40
2	2 in. x 1½ in. malleable reducers.....	.25	.50

HOUSTON STREET REGULATOR, NORTHWOOD SURVEY, CHATHAM—Continued

Quantity	Item	Unit cost	Reproduction cost new
2	1½ in. nipples.....	\$0.10	\$0.20
1	2 in. x 1 in. saddle.....		1.22
1	Mercury gauge and connection.....		4.50
2	Young B regulators.....	35.00	70.00
2	1 in. malleable elbows.....	.16	.32
2	1 in. brass stop cocks.....	1.03	2.06
4	1 in. nipples.....	.07	.28
2	2 in. x 1 in. bushings.....	.11	.22
1	2 in. malleable tee.....		.44
1	2 in. ell, malleable.....		.33
10 ft.	2 in. pipe.....	.24	2.40
5 ft.	4 in. pipe.....	.62	3.10
	Box.....		4.00
	1 in. main connection.....		5.00
	Labour, team, and miscellaneous.....		12.00
	Total.....		\$121.04

No. 2 FARMERS' LINE, DOVER CENTRE

Crawford near Exposure 11, off Sarnia Line, Baldoon lot 27-28

1	1 in. Field high pressure regulator.....		\$22.50
1	No. 1 Tobey meter.....		14.70
1	1 in. brass stop cock.....		1.03
	Small fittings.....		1.00
	Box.....		3.00
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		8.00
	Total.....		\$55.23

No. 4 FARMERS' LINE, CONCESSION XIV, NORTHERN LINE

6	1 in. malleable elbows.....	\$0.16	\$0.96
3	1 in. brass stop cocks.....	1.03	3.09
2	1 in. tees.....	.22	.44
1	1 in. x ½ in. tee.....		.22
3	1 in. ground seat flange unions.....	.70	2.10
14	1 in. nipples.....	.07	.98
1	1 in. high pressure Field regulator.....		22.50
3 ft.	1 in. pipe.....	.10	.30
	Box, 4 ft. x 2 ft. x 3 ft.....		6.00
1	No. 4 Tobey meter.....		117.50
2	2 in. x 1½ in. reducers.....	.25	.50
	Box, 2 ft. x 2 ft. x 3 ft.....		3.50
	Main connection.....		5.00
1	Young B regulator.....		35.00
	Labour and miscellaneous.....		21.00
	Total.....		\$219.09

No. 5 FARMERS' LINE, OFF NORTHERN

Quantity	Item	Unit cost	Reproduction cost new
1	1 in. Field high pressure regulator.....		\$22.50
1	No. 4 Tobey meter.....		117.50
1	1 in. brass stop cock.....		1.03
	Fittings.....		2.00
	Box.....		3.00
	1 in. main connection.....		5.00
	Labour, cartage, and miscellaneous.....		15.00
	Total.....		\$166.03

No. 6 FARMERS' LINE, NORTHERN

1	1 in. Field high pressure regulator.....		\$22.50
	No. 4 Tobey meter.....		117.50
1	1 in. brass stop cock.....		1.03
	Small fittings.....		2.00
	1 in. main connection.....		5.00
	Box.....		3.00
	Labour, cartage, and miscellaneous.....		15.00
	Total.....		\$166.03

CHATHAM TOWNSHIP PUMP

1	2 in. Chaplin-Fulton low pressure regulator.....		\$71.80
3	2 in. high pressure gate valves.....	\$14.00	42.00
1	2 in. brass core stop cock.....		3.14
2	2 in. street elbows, malleable.....	.37	.74
4	2 in. tees.....	.44	1.76
3	2 in flange unions, heavy cast.....	1.22	3.66
1	2 in. x 1 in. saddle.....		1.22
1	Mercury gauge and connection.....		4.50
1	6 in. x 2 in. swedge nipple.....		3.98
1	6 in. light cast elbow.....		2.55
14	2 in. nipples.....	.16	2.24
	2 in. main connection.....		10.50
	Hut, 4 ft. x 6 ft. x 6 ft.....		22.00
3	No. 4 Tobey meters.....	117.50	352.50
	Hut, 6 ft. x 10 ft. x 6 ft., wood.....		40.00
1	8 in. pipe oil seal and connection.....		20.00
	Labour, cartage, and miscellaneous.....		55.00
	Total.....		\$637.59

No. 3 UNION FARMERS' LINE

2	2 in. heavy cast elbows.....	\$0.58	\$1.16
2	2 in. heavy cast tees.....	.73	1.46
1	2 in. plug.....		.08
1	2 in. x 1 in. bushing.....		.11
2	2 in. light cast flange unions.....	.81	1.62

No. 3 UNION FARMER'S LINE—Continued

Quantity	Item	Unit cost	Reproduction cost, new
1	2 in. Chaplin-Fulton high pressure regulator.....		\$71.80
1	Bristol recording gauge.....		68.00
6	2 in. nipples.....	\$0.16	.96
3 ft.	2 in. pipe.....	.24	.72
	2 in. main connection.....		10.50
4	2 in. malleable elbows.....	.33	1.32
2	2 in. nipples.....	.16	.32
1	2 in. Dresser coupling.....		1.26
1	2 in. street elbow, malleable.....		.37
2	2½ in. x 2 in. malleable reducers.....	.50	1.00
1	No. 25 Westinghouse oil meter.....		214.50
	House, 5 ft. x 4 ft. x 4 ft.....		14.70
	Labour, team, and miscellaneous.....		40.00
	Total.....		\$429.88

WALLACEBURG

OUTSIDE BUILDING			
4	4 in. high pressure gate valves.....	\$26.10	\$104.40
2	4 in. heavy cast elbows.....	2.68	5.36
2	4 in. malleable elbows.....	1.93	3.86
2	4 in. Dresser line sleeves.....	3.90	7.80
2	6 in. Crane gate valves.....	22.65	45.30
5	8 in. flange gate valves.....	87.40	437.00
4	8 in. high pressure gate valves (screw).....	81.00	324.00
4	8 in. heavy cast tees.....	20.30	81.20
10	8 in. heavy cast elbows.....	13.00	130.00
16	8 in. nipples.....	3.60	57.60
2	8 in. x 6 in. swedge nipples.....	5.48	10.96
6	8 in. orifice flanges, plate and connections.....	59.00	354.00
4	6 in. cushions, 4 ft. each.....	6.40	25.60
4	6 in. caps, pipe.....	1.00	4.00
1	3 in. heavy cast elbow.....		1.53
2	4 in. x 3 in. swedge nipples.....	1.57	3.14
1	4 in. orifice flange, plate and connection.....		48.00
53 ft.	4 in. pipe.....	.62	32.86
4	4 in. nipples.....	.72	2.88
80 ft.	8 in. pipe.....	1.50	120.00
7 ft.	6 in. pipe.....	1.10	7.70
12 ft.	8 in. risers.....	1.50	18.00
4	8 in. heavy cast elbows.....	13.00	52.00
2	2 in. brass stop cocks.....	3.35	6.70
4	2 in. malleable street elbows.....	.37	1.48
6	2 in. malleable elbows.....	.33	1.98
9	2 in. nipples.....	.16	1.44
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
1	Mercury gauge and connections.....		4.50
2	No. 4 Tobey meters.....	117.50	235.00
14 ft.	2 in. pipe.....	.24	3.36
	Box, 5 ft. x 2 ft. x 2 ft.....		6.00
60 ft.	3 in. pipe.....	.44	26.40
150 ft.	8 in. pipe drip.....	1.50	22.50
6 ft.	2 in. pipe.....	.24	1.44

WALLACEBURG—Continued

Quantity	Item	Unit cost	Reproduction cost new
1	2 in. gate valve..... IN BUILDING		\$8.00
2	4 in. malleable elbows.....	\$1.93	3.86
4	4 in. light cast elbows.....	1.13	4.52
6	4 in. high pressure gate valves.....	26.10	156.60
8	4 in. nipples.....	.72	5.76
3	4 in. Dresser line sleeves.....	3.90	11.70
2	6 in. high pressure gate valves.....	46.50	93.00
3	8 in. flange gate valves.....	87.40	174.80
4	6 in. screw gate valves.....	46.50	186.00
2	6 in. Chaplin-Fulton regulator, high pressure.....	269.00	538.00
1	8 in. Chaplin-Fulton regulator, high pressure.....		400.00
1	3 in. Chaplin-Fulton regulator, high pressure.....		126.00
3	3 in. Darling high pressure gate valves.....	22.60	67.80
2	3 in. heavy cast elbows.....	1.53	3.06
6	3 in. nipples.....	.43	2.58
10 ft.	3 in. pipe.....	.44	4.40
32 ft.	4 in. pipe.....	.62	19.84
28 ft.	10 in. pipe.....	2.00	56.00
13	Welded joints.....	3.00	39.00
16 ft.	6 in. pipe.....	1.10	17.60
19 ft.	8 in. pipe.....	1.50	28.50
6	Sets float type Foxboro gauges with connections.....	276.00	1,656.00
2	Bristol recording pressure gauges.....	68.00	136.00
	Building, 13 ft. 4 in. x 27 ft. 4 in. x 7 ft.....		149.00
	Labour, team, and miscellaneous.....		675.00
	Total.....		\$7,025.31

DRESDEN LINE METER AND REGULATOR, MAIN LINE

2	4 in. heavy cast elbows.....	\$2.68	\$5.36
2	4 in. heavy cast tees.....	4.45	8.90
2	4 in. x 3 in. swedge nipples.....	1.57	3.14
2	4 in. x 2 in. swedge nipples.....	1.88	3.76
1	3 in. high pressure gate valve.....		18.60
1	4 in. high pressure gate valve.....		26.10
2	2 in. high pressure gate valves.....	14.00	28.00
1	3 in. high pressure Chaplin-Fulton regulator.....		126.00
1	3 in. nipple.....		.43
2	2 in. heavy cast elbows.....	.58	1.16
2	2 in. nipples.....	.16	.32
1	2 in. Dresser line sleeve.....		2.43
1	4 in. Dresser line sleeve.....		3.90
1	4 in. nipple.....		.72
1	4 in. orifice flange, plate and connections.....		48.00
1	Set of float type Foxboro gauges and connections.....		276.00
1	4 in. heavy cast tee.....		4.45
1	4 in. plug.....		.34
1	4 in. heavy cast elbow.....		2.68
	Hut, 5 ft. x 8 ft. x 5 ft., wood.....		27.40
20 ft.	2 in. pipe.....	.24	4.80
15 ft.	4 in. pipe.....	.62	9.30
36 ft.	4 in. pipe.....	.62	22.32
	Labour, team, and miscellaneous.....		53.00
	Total.....		\$677.11

TUPPERVILLE REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
1	2 in. high pressure gate valve.....		\$14.00
1	3 in. high pressure gate valve.....		18.60
1	2 in. cast tee.....		.73
1	3 in. light cast tee.....		1.00
1	2 in. heavy cast elbow.....		.58
1	3 in. light cast elbow.....		.69
4	3 in. x 2 in. swedge nipples.....	\$1.18	4.72
1	2 in. x 1 in. saddle.....		1.22
1	3 in. x 1 in. saddle.....		1.50
1	3 in. low pressure Chaplin-Fulton regulator.....		126.00
2	2 in. malleable tees.....	.44	.88
6	2 in. malleable elbows.....	.33	1.98
4	2 in. nipples.....	.16	.64
1	2 in. Dresser coupling.....		1.26
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connections.....		20.00
1	1 in. brass stop cock.....		1.03
1	1 in. Dresser coupling.....		.63
6 ft.	1 in. pipe.....	.10	.60
9 ft.	2 in. pipe.....	.24	2.16
11 ft.	2 in. pipe.....	.24	2.64
2	No. 4 Tobey meters.....	117.50	235.00
	House, 9 ft. x 7 ft. x 7 ft.....		45.50
	Labour, team, and miscellaneous.....		50.00
	Total.....		\$535.86

DRESDEN TOWN ORIFICE METERS

4	4 in. malleable elbows.....	\$1.93	\$7.72
2	4 in. x 2 in. light cast tees.....	1.62	3.24
2	4 in. No. 125 Jenkins gate valves.....	15.20	30.40
1	2 in. high pressure gate valve.....		14.00
1	2 in. low pressure gate valve.....		8.00
1	2 in. Dresser line sleeve.....		2.43
2	2 in. heavy cast elbows.....	.58	1.16
4	2 in. nipples.....	.16	.64
5	4 in. nipples.....	.72	3.60
1	4 in. orifice flange, plate and connection.....		48.00
1	Set of Foxboro float type gauges and connection.....		276.00
1	Pressure gauge and connection.....		7.00
12 ft.	2 in. pipe.....	.24	2.88
18 ft.	2 in. pipe.....	.24	4.32
	House, corrugated iron sides and wood roof, 10 ft. x 10 ft. x 7 ft.....		54.00
	1 in. main connection.....		5.00
	Labour, team, and miscellaneous.....		26.00
	Total.....		\$494.39

DRESDEN, HOLDEN STREET REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
2	4 in. heavy cast elbows.....	\$2.68	\$5.36
2	4 in. heavy cast tees.....	4.45	8.90
2	4 in. x 2 in. heavy cast tees.....	4.45	8.90
2	4 in. flange gate valves, extra heavy.....	57.10	114.20
8	4 in. nipples.....	.72	5.76
1	4 in. x 1 in. saddle.....		1.73
1	4 in. low pressure Chaplin-Fulton regulator.....		160.00
1	2 in. high pressure gate valve.....		14.00
1	2 in. Dresser coupling.....		1.26
1	2 in. malleable elbow.....		.33
5	2 in. nipples.....	.16	.80
1	1 in. brass stop cock.....		1.03
1	1 in. nipple.....		.07
1	1 in. street elbow.....		.19
1	4 in. x 3 in. swedge nipple.....		1.57
1	4 in. bull plug.....		2.85
1	4 in. safety.....		18.00
1	Mercury gauge and connection.....		4.50
	4 in. main connection.....		44.50
	House, 8 ft. x 8 ft. x 7 ft., corrugated iron.....		40.00
	Labour, team, and miscellaneous.....		59.00
	Total.....		\$492.95

DRESDEN, CENTRE STREET REGULATOR

2	4 in. heavy cast elbows.....	\$2.68	\$5.36
2	4 in. heavy cast tees.....	4.45	8.90
2	4 in. x 2 in. heavy cast tees.....	4.45	8.90
1	3 in. No. 125 Jenkins gate valve.....		11.20
1	4 in. No. 125 Jenkins gate valve.....		15.20
1	3 in. x 4 in. Chaplin-Fulton low pressure regulator.....		126.00
1	3 in. x ½ in. bushing.....		.23
1	2 in. brass stop cock.....		3.35
1	2 in. high pressure gate valve.....		14.00
2	2 in. Dresser couplings.....	1.26	2.52
2	2 in. malleable elbows.....	.33	.66
4	2 in. nipples.....	.16	.64
6 ft.	2 in. pipe.....	.24	1.44
6 ft.	4 in. pipe.....	.44	2.64
2	4 in. nipples.....	.72	1.44
2	3 in. nipples.....	.43	.86
	4 in. main connection.....		44.50
1	4 in. x 3 in. swedge nipple.....		1.57
1	4 in. x 2 in. bushing.....		.38
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
	Building, 6 ft. x 8 ft. x 7 ft.....		39.00
	Labour, team, and miscellaneous.....		41.00
	Total.....		\$354.29

DRESDEN, WATER STREET REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
2	4 in. heavy cast elbows.....	\$2.68	\$5.36
1	4 in. heavy cast tee.....		4.45
1	4 in. malleable tee.....		1.85
2	3 in. heavy cast tees.....	2.43	4.86
2	4 in. x 3 in. swedge nipples.....	1.57	3.14
1	3 in. high pressure gate valve.....		18.60
1	4 in. high pressure gate valve.....		26.10
2	2 in. high pressure gate valves.....	14.00	28.00
4	3 in. nipples.....	.43	1.72
2	4 in. nipples.....	.72	1.44
1	4 in. low pressure Chaplin-Fulton regulator.....		160.00
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
1	2 in. Dresser coupling.....		1.26
1	2 in. malleable elbow.....		.33
1	2 in. malleable tee.....		.44
8	2 in. nipples.....	.16	1.28
1	2 in. plug.....		.08
	Main connection.....		44.50
	Building, 7 ft. x 7 ft. x 7 ft.....		39.20
	Labour, team, and miscellaneous.....		48.00
	Total.....		\$415.11

DRESDEN, TALBOT STREET REGULATOR

1	3 in. heavy cast elbow.....		\$1.53
1	3 in. x 2 in. heavy cast tee.....		2.43
1	3 in. light cast tee.....		1.00
1	3 in. Jenkins No. 125 valve.....		11.20
2	3 in. nipples.....	\$0.43	.86
1	4 in. x 3 in. swedge nipple.....		1.57
1	4 in. low pressure Chaplin-Fulton regulator.....		160.00
1	4 in. Jenkins No. 125 valve.....		15.20
2	4 in. nipples.....	.72	1.44
1	4 in. malleable tee.....		1.85
1	4 in. x 2 in. bushing.....		.38
1	4 in. x 2 in. heavy cast tee.....		4.45
1	4 in. heavy cast elbow.....		2.68
2	2 in. malleable elbows.....	.33	.66
	Building, 7 ft. x 7 ft. x 7ft.....		39.20
5	2 in. nipples.....	.16	.80
1	2 in. iron stop cock, brass core.....		3.14
1	2 in. low pressure gate valve.....		8.00
1	2 in. Dresser coupling.....		1.26
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
6 ft.	2 in. pipe.....	.24	1.44
4 ft.	3 in. pipe.....	.44	1.76
8 ft.	4 in. pipe.....	.62	4.96
	Labour, team, and miscellaneous.....		48.00
	AT DRESDEN OFFICE		
1	Pressure gauge and connection.....		9.00
1	Pressure recording gauge and connection.....		68.00
	Total.....		\$415.31

SOMBRA LINE REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
1	3 in. heavy cast elbow.....		\$1.53
1	4 in. heavy cast elbow.....		2.68
1	3 in. x 2 in. heavy cast tee.....		2.43
1	4 in. x 2 in. heavy cast tee.....		4.45
2	2 in. heavy cast elbows.....	\$0.58	1.16
3	2 in. high pressure gate valves.....	14.00	42.00
1	2 in. flange union light cast.....		.81
11	2 in. nipples.....	.16	1.76
3	3 in. x 2 in. swedge nipples.....	1.18	3.54
2	2 in. x 1 in. bushing.....	.11	.22
1	2 in. Emco high pressure balance valve regulator.....		134.00
1	2 in. Dresser coupling.....		1.26
2	2 in. malleable elbows.....	.33	.66
1	3 in. malleable elbow.....		.81
1	No. 50 Westinghouse oil meter and connection.....		343.00
1	Pressure gauge and connection.....		7.00
1	Bristol recording gauge and connection.....		68.00
6 ft.	2 in. pipe.....	.24	1.44
4 ft.	4 in. pipe.....	.62	2.48
3 ft.	3 in. pipe.....	.44	1.32
3	Building, 5 ft. x 8 ft. x 5 ft.....		27.20
	4 in. x 2 in. swedge nipples.....	1.88	5.64
	3 in. main connection.....		24.00
	Labour, team, and miscellaneous.....		66.00
	Total.....		\$743.39

LAMBTON LINE CHECKING METER

2	2 in. malleable elbows.....	\$0.33	\$0.66
3	2 in. street elbows, malleable.....	.37	1.11
2	2½ in. x 2 in. reducers, malleable.....	.50	1.00
1	2 in. x 1 in. saddle.....		1.22
1	No. 25 Westinghouse oil meter.....		214.50
1	Bristol recording gauge.....		68.00
1	2 in. malleable tee.....		.44
1	2 in. plug.....		.08
18 ft.	2 in. pipe.....	.24	4.32
	2 in. main connection.....		10.50
	Meter box.....		3.00
	Labour, team, and miscellaneous.....		29.00
	Total.....		\$333.83

PORT LAMBTON REGULATOR

1	3 in. heavy cast elbow.....		\$1.53
2	3 in. heavy cast tees.....	\$2.43	4.86
1	4 in. heavy cast elbow.....		2.68
2	4 in. heavy cast tees.....	4.45	8.90
1	4 in. x 2 in. bushing.....		.38
2	3 in. x 2 in. swedge nipples.....	1.18	2.36
3	4 in. x 3 in. swedge nipples.....	1.57	4.71

PORT LAMBTON REGULATOR—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	3 in. high pressure gate valve.....		\$18.60
1	4 in. high pressure gate valve.....		26.10
1	2 in. high pressure gate valve.....		14.00
1	2 in. brass stop cock.....		3.35
1	3 in. plug.....		.20
1	2 in. Dresser coupling.....		1.26
7	3 in. nipples.....	\$0.43	3.01
3	4 in. nipples.....	.72	2.16
5	2 in. nipples.....	.16	.80
1	3 in. Chaplin-Fulton low pressure regulator.....		126.00
1	Mercury gauge and connection.....		4.50
1	Cylinder oil seal, 12 in. x 60 in., and connection.....		20.00
	3 in. main connection.....		24.00
	Building, 8 ft. x 10 ft. x 7 ft.....		53.00
3 ft.	2 in. pipe.....	.24	.72
6 ft.	3 in. pipe.....	.44	2.64
6 ft.	4 in. pipe.....	.62	3.72
	Labour, team, and miscellaneous.....		42.00
	Total.....		\$371.48

SOMBRA REGULATOR

10	2 in. nipples.....	\$0.16	\$1.60
4	No. 4 Tobey meters.....	117.50	470.00
1	Mercury gauge and connection.....		4.50
1	Pressure gauge and connection.....		7.00
1	Cylinder, 12 in. x 60 in., oil seal and connection.....		20.00
12	Welded joints.....	3.00	36.00
4 ft.	6 in. pipe.....	1.10	4.40
24 ft.	6 in. pipe.....	1.10	26.40
	3 in. main connection.....		24.00
	Building, 8 ft. x 12 ft. x 7 ft.....		60.00
2	6 in. light cast elbows.....	2.55	5.10
1	6 in. light cast tee.....		3.70
2	6 in. x 3 in. heavy cast tees.....	9.72	19.44
1	6 in. x 3 in. swedge nipple.....		3.32
1	6 in. x 4 in. swedge nipple.....		2.93
1	4 in. x 3 in. swedge nipple.....		1.57
1	3 in. light cast elbow.....		.69
1	3 in. malleable elbow.....		.81
1	3 in. malleable tee.....		1.10
1	4 in. malleable elbow.....		1.93
5	3 in. nipples.....	.43	2.15
1	3 in. high pressure gate valve.....		18.60
1	3 in. low pressure Chaplin-Fulton regulator.....		126.00
1	3 in. Dresser coupling.....		1.67
1	4 in. x 2 in. swedge nipple.....		1.88
2	4 in. nipples.....	.72	1.44
1	2 in. high pressure gate valve.....		14.00
5	2 in. brass stop cocks.....	3.35	16.75
2	2 in. heavy cast elbows.....	.58	1.16
2	3 in. x 2 in. swedge nipples.....	1.18	2.36
5	2 in. Dresser couplings.....	1.26	6.30
	Labour, team, and miscellaneous.....		94.00
	Total.....		\$980.80

WILKESPORT LOW PRESSURE REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
3	2 in. malleable tees.....	\$0.44	\$1.32
3	2 in. malleable elbows.....	.33	.99
1	2 in. street malleable elbow.....		.37
2	2 in. high pressure gate valves.....	14.00	28.00
2	2 in. x 1 in. malleable tees.....	.44	.88
9	2 in. nipples.....	.16	1.44
1	2 in. low pressure Chaplin-Fulton regulator.....		71.80
1	No. 4 Tobey meter.....		117.50
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
2	2 in. plugs.....	.08	.16
1	1 in. brass stop cock.....		1.03
1	1 in. lip union.....		.23
3	1 in. nipples.....	.07	.21
6 ft.	2 in. pipe.....	.24	1.44
	2 in. main connection.....		10.50
	Building, 6 ft. x 6 ft. x 7 ft., wood.....		35.80
	Labour, team, and miscellaneous.....		35.00
	Total.....		\$331.17

WILKESPORT HIGH PRESSURE REGULATOR

2	2 in. malleable elbows.....	\$0.33	\$0.66
2	2 in. malleable tees.....	.44	.88
2	2 in. x 1 in. malleable tees.....	.44	.88
3	2 in. x 1 in. bushings.....	.11	.33
1	2 in. plug.....		.08
2	2 in. high pressure gate valves.....	14.00	28.00
6	1 in. nipples.....	.07	.42
1	1 in. Dresser coupling.....		.63
1	1 in. brass stop cock.....		1.03
1	1 in. lip union.....		.23
1	1 in. Emco high pressure regulator.....		42.60
5 ft.	2 in. pipe.....	.24	1.20
	Building, 6 ft. x 6 ft. x 7 ft., wood (fair).....		35.80
	Labour, team, and miscellaneous.....		14.00
	Total.....		\$126.74

BRIGDEN LINE REGULATOR

7	3 in. malleable elbows.....	\$0.81	\$5.67
2	3 in. x 1 in. saddles.....	1.50	3.00
2	1 in. brass stop cocks.....	1.03	2.06
1	1 in. street elbow, malleable.....		.19
2	1 in. nipples.....	.07	.14
6	3 in. nipples.....	.43	2.58
1	3 in. high pressure Chaplin-Fulton regulator.....		126.00
2	3 in. Dresser couplings.....	1.67	3.34
1	3 in. high pressure gate valve.....		18.60
1	No. 50 Westinghouse oil meter.....		343.00

BRIGDEN LINE REGULATOR—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
8 ft.	3 in. pipe.....	\$0.44	\$3.52
1	Bristol recording gauge and connection.....		68.00
	3 in. main line connection.....		24.00
	Building, 6 ft. x 6 ft. x 12 ft., wood.....		46.00
	Labour, team, and miscellaneous.....		50.00
	Total.....		\$696.10

BRIGDEN REGULATOR

1	Pressure gauge and connection.....		\$7.00
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
2	2 in. malleable tees.....	\$0.44	.88
14 ft.	2 in. pipe.....	.24	3.36
4 ft.	3 in. pipe.....	.44	1.76
4 ft.	4 in. pipe.....	.62	2.48
	Building, 8 ft. x 10 ft. x 7 ft., corrugated iron sides (fair).....		53.10
1	4 in. heavy cast tee.....		4.45
1	4 in. plug.....		.34
1	4 in. x 2 in. swedge nipple.....		1.88
1	3 in. heavy cast elbow.....		1.53
1	3 in. x 2 in. heavy cast tee.....		2.43
1	3 in. heavy cast tee.....		2.43
1	3 in. high pressure gate valve.....		18.60
4	3 in. nipples.....	.43	1.72
2	3 in. x 2 in. swedge nipples.....	1.18	2.36
1	2 in. high pressure gate valve.....		14.00
1	2 in. x 1 in. saddle.....		1.22
2	1 in. brass stop cocks.....	1.03	2.06
1	1 in. nipple.....		.07
1	3 in. malleable tee.....		1.10
1	3 in. x 1 in. bushing.....		.23
1	2 in. malleable tee.....		.44
1	2 in. x 1 in. bushing.....		.11
2	2 in. malleable elbows.....	.33	.66
1	2 in. cast stop cock, brass core.....		3.14
1	2 in. Dresser coupling.....		1.26
8	2 in. nipples.....	.16	1.28
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
1	3 in. low pressure Chaplin-Fulton regulator.....		126.00
	Labour, team, and miscellaneous.....		45.00
	Total.....		\$397.19

MOORETOWN LINE REGULATOR

4	4 in. heavy cast elbows.....	\$2.68	\$10.72
2	4 in. x 2 in. heavy cast tees.....	4.45	8.90
2	4 in. high pressure gate valves.....	26.10	52.20
6	4 in. nipples.....	.72	4.32
1	4 in. high pressure Chaplin-Fulton regulator.....		160.00

MOORETOWN LINE REGULATOR—Continued

Quantity	Item	Unit cost	Reproduction cost new
2	4 in. x 3 in. swedge nipples.....	\$1.57	\$3.14
3	3 in. light cast elbows.....	1.00	3.00
2	3 in. malleable elbows.....	.81	1.62
4	3 in. nipples.....	.43	1.72
2	3 in. Dresser couplings.....	1.67	3.34
2	2 in. heavy cast elbows.....	1.53	3.06
1	2 in. high pressure gate valve.....		14.00
1	2 in. cast stop cock, brass core.....		3.14
1	2 in. Dresser line sleeve.....		2.43
5	2 in. nipples.....	.16	.80
1	No. 50 Westinghouse oil meter.....		343.00
1	Bristol recording gauge and connection.....		68.00
3 ft.	2 in. pipe.....	.24	.72
8 ft.	3 in. pipe.....	.44	3.52
12 ft.	4 in. pipe.....	.62	7.44
	4 in. main connection.....		44.50
	Building, 6 ft. x 15 ft. x 7 ft.....		61.40
	Labour, team, and miscellaneous.....		80.00
	Total.....		\$880.97

MOORETOWN REGULATOR

2	2 in. heavy cast elbows.....	\$1.53	\$3.06
1	2 in. heavy cast tee.....		.73
1	2 in. malleable tee.....		.44
1	2 in. brass stop cock.....		3.35
1	2 in. high pressure gate valve.....		14.00
2	2 in. x 1 in. saddle.....	1.22	2.44
1	1 in. brass stop cock.....		1.03
1	1 in. Dresser coupling.....		.63
1	1 in. malleable elbow.....		.16
3	1 in. nipples.....	.07	.21
12	2 in. nipples.....	.16	1.92
1	2 in. Dresser line sleeve.....		2.43
2	2 in. malleable street elbows.....	.37	.74
2	2 in. malleable elbows.....	.33	.66
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
2	No. 4 Tobey meter.....	117.50	235.00
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
1	2 in. plug.....		.08
8	Welded joints.....	2.25	18.00
12 ft.	2 in. pipe.....	.24	2.88
6 ft.	3 in. pipe.....	.44	2.64
	Building, 9 ft. x 6 ft. x 7 ft.....		42.20
	Labour.....		44.00
	Total.....		\$472.90

FROOMFIELD REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
1	2 in. x 1 in. malleable reducer.....		\$0.25
1	2 in. x 1 in. bushing.....		.11
3	1 in. street elbows, malleable.....	\$0.19	.57
2	1 in. nipples.....	.07	.14
1	1 in. brass stop cock.....		1.03
1	2 in. x 1 in. tee.....		.44
1	Young B regulator.....		35.00
1	Mercury gauge and connection.....		4.50
	Box.....		3.00
	Labour, team, and miscellaneous.....		7.00
	Total.....		\$52.04

CORUNNA REGULATOR

1	2 in. heavy cast elbow.....		\$0.58
1	2 in. x 1 in. saddle.....		1.22
1	2 in. high pressure gate valve.....		14.00
1	2 in. malleable tee.....		.44
1	2 in. x 1 in. bushing.....		.11
1	2 in. lip union.....		.23
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
4	2 in. nipples.....	\$0.16	.64
1	3 in. x 2 in. malleable reducer.....		.58
2	3 in. nipples.....	.43	.86
1	3 in. low pressure Chaplin-Fulton regulator.....		126.00
1	3 in. malleable elbow.....		.81
1	4 in. x 3 in. swedge nipple.....		1.57
1	4 in. Jenkins No. 125 valve.....		15.20
1	4 in. x 1 in. saddle.....		1.73
1	4 in. malleable elbow.....		1.93
2	1 in. street elbows.....	.19	.38
2	1 in. brass stop cocks.....	1.03	2.06
1	1 in. lip union.....		.23
1	1 in. tee.....		.22
1	1 in. plug.....		.03
3	1 in. nipples.....	.07	.21
5 ft.	1 in. pipe.....	.10	.50
6 ft.	2 in. pipe.....	.24	1.44
5 ft.	4 in. pipe.....	.42	2.10
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
	Building, 6 ft. x 9 ft. x 7 ft.....		43.60
	2 in. main line connection.....		10.50
	Labour, team, and miscellaneous.....		42.00
	Total.....		\$365.47

COURTRIGHT REGULATOR

4	4 in. heavy cast elbows.....	\$2.68	\$10.72
1	4 in. malleable elbow.....		1.93
2	4 in. x 2 in. heavy cast tees.....	4.45	8.90
1	5% in. heavy cast elbow.....		6.00
1	5% in. x 4 in. swedge nipple.....		3.82

COURTRIGHT REGULATOR—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
2	6 in. x 4 in. swedge nipples.....	\$2.93	\$5.86
1	4 in. high pressure gate valve.....		26.10
1	Mercury gauge and connection.....		4.50
5	4 in. nipples.....	.72	3.60
1	4 in. Chaplin-Fulton low pressure regulator.....		160.00
1	8 in. pipe oil seal and connection.....		20.00
1	2 in. high pressure gate valve.....		14.00
1	2 in. cast stop cock, brass core.....		3.14
7	2 in. Dresser coupling.....	1.26	8.82
1	2 in. Dresser line sleeve.....		2.43
1	2 in. flange union, light.....		.81
1	2 in. malleable tee.....		.44
1	2 in. malleable elbow.....		.33
18	2 in. nipples.....	.16	2.88
6	2 in. brass stop cocks.....	3.35	20.10
6	No. 4 Tobey meters.....	117.50	705.00
14	Welded joints.....	2.25	31.50
10 ft.	2 in. pipe.....	.24	2.40
25 ft.	6 in. pipe.....	1.10	27.50
14 ft.	4 in. pipe.....	.62	8.68
	House, wood, 8 ft. x 18 ft. 6 in. x 7 ft.....		83.20
	Labour, team, and miscellaneous.....		114.00
	Total.....		\$1,276.66

PARKER LINE, OFF CORUNNA LINE

1	1½ in. Emco regulator.....		71.00
1	No. 1 Tobey meter.....		14.70
1	1 in. brass stop cock.....		1.03
3	1 in. nipples.....	\$0.07	.21
3	1 in. malleable elbows.....	.16	.48
	Labour, team, and miscellaneous.....		5.00
	Total.....		\$92.42

CORUNNA LINE REGULATOR

2	2 in. malleable elbows.....	\$0.33	\$0.66
3	2 in. nipples.....	.16	.48
1	2 in. Chaplin-Fulton high pressure regulator.....		71.80
2	3 in. x 2 in. reducers.....	.58	1.16
	Box, 4 ft. x 2 ft. x 4 ft.....		10.00
3	2 in. malleable elbows.....	.33	.99
1	2 in. street elbow, malleable.....		.37
2	2½ in. x 2 in. malleable reducers.....	.50	1.00
3	2 in. nipples.....	.16	.48
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
1	No. 25 Westinghouse oil meter.....		214.50
1	Bristol recording gauge.....		68.00
5 ft.	2 in. pipe.....	.24	1.20
	House, 5 ft. x 5 ft. x 4 ft.....		16.80
	Labour.....		49.00
	Total.....		\$508.24

EDWARDS LINE, SOUTH OF CORUNNA

Quantity	Item	Unit cost	Reproduction cost new
1	1 in. Chaplin-Fulton low pressure regulator.....		\$36.00
1	No. 1 Tobey meter.....		14.70
1	1 in. brass stop cock.....		1.03
2	1 in. elbows.....	\$0.16	.32
2	1 in. nipples.....	.07	.14
1	1 in. street elbow.....		.19
	Main connection.....		5.00
	Labour, team, and miscellaneous.....		10.00
	Total.....		\$67.38

FARMERS' LINE, BRIGDEN SIDE ROAD

4	2 in. malleable elbows.....	\$0.33	\$1.32
2	2 in. malleable street elbows.....	.37	.74
2	2 in. malleable tees.....	.44	.88
2	2 in. x 1/2 in. bushing.....	.11	.22
1	2 in. x 1 in. bushing.....		.11
1	2 in. x 1 in. malleable reducer.....		.25
1	2 in. x 1 1/2 in. malleable reducer.....		.25
1	2 in. x 1 1/2 in. bushing.....		.11
1	2 in. brass stop cock.....		3.35
4	2 in. nipples.....	.16	.64
2	1 in. nipples.....	.07	.14
1	1 in. Field regulator.....		22.50
1	No. 3 Tobey meter.....		47.00
6 ft.	2 in. pipe.....	.24	1.44
	House, 6 ft. x 5 ft. x 4 ft., wood.....		18.80
	1 in. main connection.....		5.00
33 ft.	2 in. pipe.....	.24	7.92
	Labour, team, and miscellaneous.....		15.00
	Total.....		\$125.67

SARNIA REGULATOR STATION

5	8 in. heavy cast elbows.....	\$13.00	\$65.00
2	8 in. heavy cast tees.....	20.30	40.60
2	8 in. light cast tees.....	9.15	18.30
2	8 in. Pratt & Cady screw high pressure gate valves.....	140.89	281.78
2	8 in. Pratt & Cady flanged high pressure gate valves.....	167.80	335.60
4	4 in. high pressure gate valves.....	26.10	104.40
1	4 in. Dresser line sleeve.....		3.90
1	4 in. Dresser coupling.....		1.93
3	1 in. light cast tees.....	1.62	4.86
1	4 in. light cast elbow.....		1.13
3	4 in. plugs.....	.34	1.02
2	8 in. Dresser line sleeves.....	11.20	22.40
2	8 in. x 1 in. saddles.....	4.37	8.74
2	1 in. brass stop cocks.....	1.03	2.06
2	1 in. nipples.....	.07	.14
2	8 in. x 4 in. bushings.....	2.23	4.46
2	8 in. x 4 in. swedge nipples.....	6.57	12.74

SARNIA REGULATOR STATION—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
5	8 in. nipples.....	\$3. 60	\$18.00
8	4 in. nipples.....	.72	5.76
2	8 in. orifice flanges, plate and connection.....	59.00	118.00
2	Cushions for orifice lines.....		5.00
32 ft.	8 in. pipe.....	1.50	48.00
27 ft.	4 in. pipe.....	.62	16.74
9 ft.	8 in. pipe socket-end.....		20.80
	Flange, pipes.....		
1	8 in. flange tee with 6 in. plug (200 lbs.).....		19.00
1	8 in. 1/4-bend flange.....		14.30
2	8 in. flange tees.....	18.00	36.00
3	8 in. extra heavy gate valves, flanged, Attwood.....	167.80	503.40
1	8 in. Chaplin-Fulton high pressure regulator, flanged.....		400.00
1	8 in. blind flange.....		3.44
1	8 in. x 1 in. saddle.....		4.37
1	8 in. flanged nipple.....		9.00
1	1 in. brass stop cock.....		1.03
3 ft.	8 in. pipe with 1 flange.....		15.66
1	8 in. heavy cast elbow.....		13.00
4	Concrete blocks under regulator.....		5.00
	Building of concrete block, concrete floor, 14 ft. x 14 ft. x 8 ft., wood roof (fair).....		260.00
	Bolts and gaskets.....		20.00
	Total.....		\$2,445.56
OUTSIDE SARNIA REGULATOR			
4 ft.	8 in. pipe.....	\$1.50	\$6.00
2	8 in. high pressure gate valves.....	81.00	162.00
1	8 in. heavy cast tee.....		20.30
1	8 in. nipple.....		3.60
5	8 in. high pressure gate valves.....	81.00	405.00
3	8 in. heavy cast tees.....	20.30	60.90
5	8 in. heavy cast elbows.....	13.00	65.00
3	8 in. Dresser line sleeves.....	11.20	33.60
9	8 in. nipples.....	3.60	32.40
1	8 in. x 2 in. swedge nipple.....		9.07
1	2 in. plug.....		.08
1	3 in. high pressure gate valve.....		18.60
1	3 in. nipple.....		.43
1	3 in. x 2 in. malleable reducer.....		.58
1	2 in. plug.....		.08
1	3 in. heavy cast elbow.....		1.53
1	3 in. nipple.....		.43
1	5 ft. x 10 ft. rivetted steel tank.....		340.00
24 ft.	3 in. pipe.....	.44	10.56
47 ft.	8 in. pipe.....	1.50	70.50
2	Sets Foxborough gauges and connection.....	2.76	552.00
1	Bristol recording gauge and connection.....		68.00
1	Pressure gauge and connection.....		7.00
	Labour, team, and miscellaneous.....		500.00
	Total.....		\$4,813.22

PETROLIA REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
3	6 in. heavy cast elbows.....	\$6.12	\$18.36
2	6 in. heavy cast tees.....	9.72	19.44
1	4 in. heavy cast tee.....		4.45
1	4 in. heavy cast elbow.....		2.68
1	6 in. high pressure flange gate valve.....		53.00
1	6 in. high pressure regulator, flanged.....		269.00
5	6 in. nipples.....	1.74	8.70
2	6 in. x 4 in. swedge nipples.....	2.93	5.86
2	8 in. x 6 in. swedge nipples.....	5.48	10.96
1	4 in. Jenkins No. 125 gate valve.....		15.20
1	4 in. extra heavy gate valve.....		40.15
1	4 in. Dresser line sleeve.....		3.90
1	4 in. plug.....		.34
1	6 in. Dresser line sleeve.....		7.20
1	8 in. x 2 in. saddle.....		4.40
3	2 in. nipples.....	.16	.48
2	2 in. high pressure gate valves.....	14.00	28.00
1	2 in. malleable tee.....		.44
1	2 in. street elbow malleable.....		.39
2	4 in. nipples.....	.72	1.44
8 ft.	4 in. pipe.....	.62	4.96
5 ft.	6 in. pipe.....	1.10	5.50
44 ft.	8 in. pipe.....	1.50	66.00
2	2 in. elbows.....	.33	.66
2	8 in. x 2 in. reducer, heavy cast.....	5.50	11.00
	Building, wood, 7 ft. x 12 ft. x 7 ft. (fair).....		56.00
2	1 in. brass stop cocks.....	1.03	2.06
2	1 in. nipples.....	.07	.14
	Labour, team, and miscellaneous.....		75.00
	Total.....		\$715.71

MARTHAVILLE LINE CHECKING METER (COPELSTON)

4	2 in. malleable elbows.....	\$0.33	\$1.32
2	2 in. nipples.....	.16	.32
1	No. 4 Tobey meter.....		117.50
5	Malleable fittings.....		3.00
	Box, 4 ft. x 4 ft. x 4 ft.....		11.00
	Labour, team, and miscellaneous.....		13.00
	Total.....		\$146.14

McCAUL LINE REGULATOR

1	1½ in. Emco regulator.....		\$71.00
1	No. 1 Tobey meter.....		14.70
1	1 in. brass stop cock.....		1.03
5	1 in. elbows.....	\$0.16	.80
2	1 in. street elbows.....	.19	.38
	Meter box, 1 ft. 3 in. x 1 ft. 3 in. x 1 ft. 3 in.....		3.00
	Labour, team, and miscellaneous.....		5.00
	Total.....		\$95.91

COPELSTON REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
4	2 in. malleable elbows.....	\$0.33	\$1.32
1	2 in. malleable street elbow.....		.39
1	2 in. malleable tee.....		.44
2	2 in. gate valves, light.....	8.00	16.00
5	2 in. nipples.....	.16	.80
2	1 in. brass stop cocks.....	1.03	2.06
1	1 in. street elbow.....		.19
1	1 in. lip union.....		.23
4	1 in. nipples.....	.07	.28
2	1 in. malleable elbows.....	.16	.32
1	2 in. x 1½ in. malleable reducer.....		.25
1	1½ in. nipple.....		.10
1	Young B regulator.....		35.00
1	No. 4 Tobey meter.....		117.50
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
9 ft.	House, 8 ft. x 10 ft. x 7 ft.....		53.10
1	2 in. pipe.....	.24	2.16
1	2 in. gate valve.....		18.42
1	2 in. nipple.....		.16
1	2 in. tee.....		.44
2	2 in. x 1 in. malleable tees.....	.44	.88
	Labour, team, and miscellaneous.....		27.50
	Total.....		\$302.04

PETROLIA ORIFICE METER

1	6 in. heavy cast elbow.....		\$6.12
1	6 in. light cast tee.....		3.70
2	6 in. Jenkins No. 125 gate valves.....	\$29.20	58.40
2	4 in. Jenkins No. 125 gate valves.....	15.20	30.40
2	8 in. x 6 in. swedge nipples.....	5.48	10.96
1	6 in. x 4 in. swedge nipple.....		2.93
1	6 in. nipple.....		1.74
2	4 in. light cast elbows.....	1.13	2.26
4	4 in. nipples.....	.72	2.88
1	8 in. orifice flange plate and connections.....		59.00
1	4 in. Dresser line sleeve.....		3.90
16 ft.	4 in. pipe.....	.62	9.92
6 ft.	6 in. pipe.....	1.10	6.60
11 ft.	8 in. pipe.....	1.50	16.50
1	Welded joint.....		3.00
1	Set Foxboro gauges and connection.....		276.00
	Labour, team, and miscellaneous.....		35.00
	Total.....		\$529.31

DAWN FIELD ORIFICE METER

Quantity	Item	Unit new	Reproduc- tion cost new
4	4 in. heavy cast elbows.....	\$2.68	\$10.72
2	4 in. x 2 in. heavy cast tees.....	4.45	8.90
2	2 in. heavy cast elbows.....	.58	1.16
1	2 in. cast stop cock, brass core.....		3.14
1	2 in. Dresser line sleeve.....		2.43
1	2 in. high pressure gate valve.....		14.00
6	4 in. nipples.....	.72	4.32
4	2 in. nipples.....	.16	.64
1	4 in. x 1 in. saddle.....		1.73
1	4 in. orifice flange, plate and connection.....		48.00
11 ft.	4 in. pipe.....	.62	6.82
11 ft.	2 in. pipe.....	.24	2.64
1	Set Foxboro gauges and connection.....		276.00
	Building, 6 ft. x 10 ft. x 6 ft.....		40.30
	Labour, team, and miscellaneous.....		20.00
	Total.....		\$440.80

FARMERS' LINE, CONCESSION III, OFF SARNIA

1	Young B regulator.....		\$35.00
1	No. 1 Tobey meter.....		14.70
1	1 in. brass stop cock.....		1.03
1	1 in. malleable elbow.....		.16
1	1 in. nipple.....		.07
	Main connection.....		5.00
	Meter box.....		4.00
	Labour, cartage, and miscellaneous.....		9.00
	Total.....		\$68.96

MOORE PHIPPS LINE REGULATOR

1	1 in. Field high pressure regulator.....		\$22.50
1	No. 1 Tobey meter.....		14.70
1	1 in. brass stop cock.....		1.03
3	1 in. nipples.....	\$0.07	.21
2	1 in. street elbows.....	.19	.38
1	1 in. x 1/2 in. tee.....		.22
	Main connection.....		5.00
	Meter box.....		4.00
	Labour, team, and miscellaneous.....		7.50
	Total.....		\$55.54

GOSPEL HALL, FARMERS' LINE

1	1 in. Field high pressure regulator.....		\$22.50
1	No. 2 Tobey meter.....		28.80
1	1 in. brass stop cock.....		1.03
2	1 1/2 in. x 1 in. malleable reducers.....	\$0.16	.32
1	1 in. lip union.....		.23

GOSPEL HALL, FARMERS' LINE—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
3	1 in. nipples.....	\$0.07	\$0.21
	Main connection.....		5.00
	Meter box.....		4.00
	Labour, team, and miscellaneous.....		10.00
	Total.....		\$72.09

JOHNSON MIFFIN LINE

1	1 in. Field high pressure regulator.....		\$22.50
1	No. 2 Tobey meter.....		28.80
1	1 in. brass stop cock.....		1.03
2	1½ in. x 1 in. malleable reducers.....	\$0.16	.32
1	1 in. lip union.....		.23
3	1 in. nipples.....	.07	.21
	Main connection.....		5.00
	Meter box.....		4.00
	Labour, team, and miscellaneous.....		10.00
	Total.....		\$72.09

FUR LINE, OFF 4-INCH FIELD LINE

1	1 in. Field high pressure regulator.....		\$22.50
1	No. 1 Tobey meter.....		14.70
1	1 in. brass stop cock.....		1.03
1	1½ in. x ½ in. tee.....		.16
1	1 in. nipple.....		.07
	Main connection.....		5.00
	Meter box.....		4.00
	Labour, team, and miscellaneous.....		7.50
	Total.....		\$54.96

ARMSTRONG AND COFFEE, FARMERS' LINE

1	1 in. Field high pressure regulator.....		\$22.50
1	No. 1 Tobey meter.....		14.70
1	1 in. brass stop cock.....		1.03
1	1½ in. x ½ in. tee.....		.16
1	1 in. nipple.....		.07
	Main connection.....		5.00
	Meter box.....		4.00
	Labour, team, and miscellaneous.....		7.50
	Total.....		\$54.96

STEVENSON, OFF WINDSOR LINE, ORIFICE METER

Quantity	Item	Unit cost	Reproduction cost new
6	8 in. welded elbows.....	\$15.00	\$90.00
8	8 in. heavy cast elbows.....	13.00	104.00
4	8 in. nipples.....	3.60	14.40
4	8 in. Jenkins No. 125 gate valves.....	46.30	185.20
2	8 in. orifice flanges, plates and connections.....	59.00	118.00
2	Sets Foxboro gauges and connections.....	276.00	552.00
4	Lines 1 in. galvanized pipe.....		10.00
	House, 6 ft. x 5 ft. x 7 ft.....		29.40
12 ft.	8 in. riser.....	1.50	18.00
29 ft.	8 in. pipe.....	1.50	43.50
	Labour, team, and miscellaneous.....		102.00
	Total.....		\$1,266.50

HASKELL FARMERS' LINE AND REIGNER FARMERS' LINE

1	1 in. Field high pressure regulator.....		\$22.50
3	1 in. brass stop cocks.....	\$1.03	3.09
2	2 in. tees.....	.22	.44
4	1 in. nipples.....	.07	.28
2	No. 1 Tobey meters.....	14.70	29.40
2	Boxes.....		6.00
	Main connection.....		5.00
	Labour, team, and miscellaneous.....		10.00
	Total.....		\$76.71

CHATHAM LINE, ORIFICE METER

3	8 in. heavy cast elbows.....	\$13.00	\$39.00
1	8 in. heavy cast tee.....		20.30
1	8 in. bull plug.....		9.00
2	8 in. Jenkins No. 125 gate valves.....	46.30	92.60
4	4 in. heavy cast elbows.....	2.68	10.72
6	4 in. nipples.....	1.74	10.44
2	4 in. Jenkins No. 125 gate valves.....	15.20	30.40
2	4 in. welded joints.....	2.25	4.50
1	8 in. orifice flange, plates and connection.....		59.00
1	Set Foxboro gauges and connection.....		276.00
8 ft.	8 in. riser.....	1.50	12.00
	Hut, 6 ft. x 5 ft. x 7 ft.....		31.00
14 ft.	8 in. pipe.....	1.50	21.00
	Labour, team, and miscellaneous.....		50.00
	Total.....		\$665.96

REID FARMERS' LINE

Quantity	Item	Unit cost	Reproduction cost new
1	Young B regulator.....		\$35.00
1	No. 1 Tobey meter.....		14.70
2	1 in. malleable elbows.....	\$0.16	.32
1	1 in. street elbow.....		.19
1	1½ in. nipple.....		.10
1	1½ in. x 1 in. reducer.....		.16
1	1 in. brass stop cock.....		1.03
	Meter box.....		4.00
40 ft.	1 in. pipe.....	.10	4.00
	Main line connection.....		5.00
	Labour, team, and miscellaneous.....		10.00
	Total.....		\$74.50

FLETCHER KELLEY FARMERS' LINE

1	1 in. Field high pressure regulator.....		\$22.50
1	No. 2 Tobey meter.....		28.80
1	1 in. brass stop cock.....		1.03
1	1 in. lip union.....		.23
2	1¼ in. x 1 in. malleable reducers.....	\$0.16	.32
1	1 in. tee.....		.22
2	1 in. nipples.....	.07	.14
30 ft.	1 in. pipe.....	.10	3.00
	Main line connection.....		5.00
	Meter box.....		4.00
	Labour, team, and miscellaneous.....		10.00
	Total.....		\$75.24

CHENNICK FARMERS' LINE

1	1 in. Field high pressure regulator.....		\$22.50
1	1 in. Crawford sensitive regulator.....		28.00
1	1 in. brass stop cock.....		1.03
3	1 in. elbows.....	\$0.16	.48
2	1 in. street elbows.....	.19	.38
3	1 in. nipples.....	.07	.21
1	No. 1 Tobey meter.....		14.70
60 ft.	1 in. pipe.....	.10	6.00
	Meter box.....		4.00
	Main line connection.....		5.00
	Labour, team, and miscellaneous.....		12.00
	Total.....		\$94.30

6TH CONCESSION FARMERS' LINE

Quantity	Item	Unit cost	Reproduction cost new
1	1½ in. Field high pressure regulator.....		\$71.00
1	2 in. Crawford sensitive regulator.....		39.50
1	No. 4 Tobey meter.....		117.50
3	1½ in. nipples.....	\$0.10	.30
1	1½ in. x 1 in. tee.....		.33
2	2 in. x 1½ in. reducers.....	.25	.50
1	2 in. x 1 in. tee.....		.25
2	1 in. x ½ in. bushings.....	.05	.10
1	Bristol recording gauge and connection.....		68.00
1	Meter box, 3 ft. x 6 ft. x 3 ft.....		11.00
1	1½ in. brass stop cock.....		2.24
1	1½ in. x 1¼ in. reducer.....		.16
57 ft.	1¼ in. pipe.....	.13	7.41
20 ft.	2 in. pipe.....	.24	4.80
	1½ in. main connection.....		7.00
	Labour, team, and miscellaneous.....		34.00
	Total.....		\$364.09

CHRYSLER LINE REGULATOR

1	1 in. Field high pressure regulator.....		\$22.50
1	1 in. Crawford sensitive regulator.....		28.00
1	No. 1 Tobey meter.....		14.70
2	1 in. elbows.....	\$0.16	.32
2	1 in. x ½ in. tees.....	.22	.44
1	1 in. brass stop cock.....		1.03
1	1 in. street elbow.....		.19
1	1 in. lip union.....		.23
7	1 in. nipples.....	.07	.49
1	Bristol recording gauge and connection.....		68.00
	Meter box.....		3.00
39 ft.	1 in. pipe.....	.10	3.90
	Main line connection.....		5.00
	Labour.....		20.00
	Total.....		\$167.80

RHODES LINE REGULATOR

1	1 in. Emco high pressure regulator.....		\$22.50
1	1 in. Crawford sensitive regulator.....		28.00
3	1 in. brass stop cocks.....	\$1.03	3.09
3	1 in. ground seat Dart unions.....	.70	2.10
2	1 in. tees.....	.22	.44
6	1 in. elbows.....	.16	.96
17	1 in. nipples.....	.07	1.19
1	1 in. x 3/8 in. tee.....		.22
	Box, 4 ft. x 4 ft. x 3 ft.....		10.00
2	1 in. brass stop cocks.....	1.03	2.06
3	1 in. street elbows.....	.19	.57
1	1 in. lip union.....		.23

RHODES LINE REGULATOR—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
2	1 in. nipples.....	\$0.07	\$0.14
2	2 in. x 1 in. reducers.....	.25	.50
1	2 in. malleable tee.....		.44
1	2 in. street elbow.....		.37
1	2 in. nipple.....		.16
1	No. 4 Tobey meter.....		117.50
	Meter box, 4 ft. x 4 ft. x 3 ft.....		10.00
	Main connection.....		5.00
	Labour, team, and miscellaneous.....		20.00
	Total.....		\$225.47

GILHULLY AND CHURCH LINES

3	1 in. brass stop cocks.....	\$1.03	\$3.09
2	1 in. Field high pressure regulators.....	22.50	45.00
3	1 in. malleable tees.....	.22	.66
4	1 in. malleable street elbows.....	.37	1.48
2	1 in. malleable elbows.....	.16	.32
2	1 in. lip unions.....	.23	.46
1	No. 1 Tobey meter.....		14.70
1	No. 3 Tobey meter.....		47.00
2	1½ in. x 1 in. malleable reducers.....	.16	.32
14	1 in. nipples.....	.07	.98
2	Boxes.....	3.00	6.00
10 ft.	1 in. pipe.....	.10	1.00
	Labour, team, and miscellaneous.....		17.00
	Total.....		\$138.01

VALETTA LINE REGULATOR

1	3 in. high pressure gate valve.....		\$18.60
2	3 in. x 2 in. swedge nipples.....	\$1.18	2.36
2	2 in. malleable elbows.....	.33	.66
3	2 in. malleable tees.....	.44	1.32
3	2 in. x 1 in. bushings.....	.11	.33
1	2 in. x 1 in. malleable reducer.....		.25
2	1 in. brass stop cocks.....	1.03	2.06
7	1 in. malleable street elbows.....	.19	1.33
1	1 in. malleable elbow.....		.16
8	1 in. nipples.....	.07	.56
2	1 in. lip unions.....	.23	.46
1	1 in. Field high pressure regulator.....		22.50
1	2 in. Chaplin-Fulton regulator.....		71.80
1	No. 4 Tobey meter.....		117.50
1	2 in. brass stop cock.....		3.35
22 ft.	1 in. pipe.....	.10	2.20
1	1½ in. brass stop cock.....		2.24
	Meter house, 5 ft. x 5 ft. x 4 ft.....		15.00
	Labour, team, and miscellaneous.....		29.00
	Total.....		\$291.68

NORTHERN LINE ORIFICE METER

Quantity	Item	Unit cost	Reproduction cost new
1	Set Foxboro gauges.....		\$276.00
	Meter house, 6 ft. x 8 ft. x 7 ft., new.....		39.00
1	Pressure gauge and connection.....		7.00
26 ft.	2 in. pipe.....	\$0.24	6.24
9 ft.	3 in. pipe.....	.44	3.96
25 ft.	6 in. pipe.....	1.10	27.50
14 ft.	6 in. pipe.....	1.10	15.40
13 ft.	8 in. pipe.....	1.50	19.50
52 ft.	2 in drip pipe.....	.24	12.48
6	6 in. heavy cast elbows.....	6.12	36.72
2	6 in. heavy cast tees.....	9.72	19.44
1	6 in. plug.....		1.00
1	6 in. plug (bull).....		4.65
4	8 in. x 6 in. swedge nipples.....	5.48	21.92
2	6 in. high pressure gate valves.....	46.50	93.00
2	3 in. high pressure gate valves.....	18.60	37.20
4	3 in. nipples.....	.43	1.72
2	3 in. heavy cast tees.....	2.43	4.86
1	3 in. heavy cast elbow.....		1.53
1	3 in. heavy cast flange union.....		1.82
3	3 in. x 2 in. swedge nipples.....	1.18	3.54
2	2 in. high pressure Chaplin-Fulton regulators.....	71.80	143.60
1	No. 50 Westinghouse oil meter.....		343.00
2	3 in. Dresser couplings.....	1.67	3.34
2	2 in. malleable elbows.....	.33	.66
1	2 in. nipple.....		.16
1	8 in. orifice flange, plate and connection.....		59.00
2	2 in. heavy cast elbows.....	.58	1.16
3	2 in. nipples.....	.16	.48
1	2 in. light cast flange.....		.81
1	Tank drip, 4 ft. x 10 ft., high pressure.....		275.00
	Labour, team, and miscellaneous.....		110.00
	Total.....		\$1,571.69

WINDSOR LINE AT BACK LINE

2 BULL HEAD DRIPS			
2	Lengths of 8 in. pipe in each drip, 80 feet.....	\$1.50	\$120.00
2	8 in. heavy cast tees.....	20.30	40.60
4	8 in. heavy cast elbows.....	13.00	52.00
4	8 in. nipples.....	3.60	14.40
2	1 in. stop cocks.....	1.03	2.06
20 ft.	1 in. pipe.....	.10	2.00
	Labour, team, and miscellaneous.....		36.00
	Total.....		\$267.06

MERLIN REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
5	2 in. heavy cast tees.....	\$0.73	\$3.65
4	2 in. plugs.....	.08	.32
2	2 in. high pressure gate valves.....	14.00	28.00
2	2 in. flange unions, heavy cast.....	1.22	2.44
1	2 in. Chaplin-Fulton regulator.....		71.80
1	2 in. x 3 in. Chaplin-Fulton low pressure regulator.....		126.00
1	3 in. high pressure gate valve.....		18.60
1	2 in. Dresser coupling.....		1.26
1	3 in. flange union.....		1.22
11	2 in. nipples.....	.16	1.76
3	3 in. nipples.....	.43	1.29
2	3 in. malleable tees.....	1.10	2.20
1	3 in. malleable elbow.....		.81
2	2 in. street elbows, malleable.....	.37	.74
1	Mercury gauge and connection.....		4.50
1	Oil seal tank and connection.....		20.00
3 ft.	8 in. cushion.....	1.50	4.50
2	8 in. tapped caps.....	1.50	3.00
2	Drips.....	106.00	212.00
9 ft.	2 in. pipe.....	.24	2.16
4 ft.	3 in. pipe.....	.44	1.76
	Building, 12 ft. x 8 ft. x 7 ft.....		53.80
	Labour, team, and miscellaneous.....		75.00
	Total.....		\$636.81

MIDDLE ROAD, RALEIGH, FARMER LINE

1	1 in. brass stop cock.....		\$1.03
3	1 in. malleable street elbows.....	\$0.19	.57
2	1 in. nipples.....	.07	.14
2	1½ in. x 1 in. malleable reducers.....	.16	.32
1	No. 1 Tobey meter.....		14.70
	Meter box.....		3.00
	Labour, team, and miscellaneous.....		5.00
	Total.....		\$24.76

GRAVEL ROAD LINE, CHECKING METER AND REGULATOR, CHATHAM AND CHARING CROSS, CHARING CROSS LOW PRESSURE

1	3 in. high pressure gate valve.....		\$18.60
2	3 in. x 2 in. swedge nipples.....	\$1.18	2.36
1	2 in. lip union.....		.53
2	2 in. nipples.....	.16	.32
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
1	No. 4 Tobey meter.....		117.50
1	2 in. malleable tee.....		.44
1	2 in. x ½ in. bushing.....		.11
2	Boxes.....	3.00	6.00
	Labour, team, and miscellaneous.....		25.00
	Total.....		\$242.66

CEMETERY LINE CHECKING METER

Quantity	Item	Unit cost	Reproduction cost new
3	1 in. brass stop cocks.....	\$1.03	\$3.09
1	1½ in. brass stop cock.....		2.24
1	1 in. Crawford sensitive regulator.....		28.00
2	1 in. lip unions.....	.23	.46
1	1 in. ground seat Dart union.....		.70
2	1 in. malleable tees.....	.22	.44
4	1 in. malleable elbows.....	.16	.64
14	1 in. nipples.....	.07	.98
2	1½ in. x 1 in. reducers, malleable.....	.16	.32
2	2 in. x 1½ in. bushings.....	.11	.22
2	2 in. malleable elbows.....	.33	.66
1	No. 4 Tobey meter.....		117.50
1	Bristol recording gauge and connection.....		68.00
3	1½ in. nipples.....	.10	.30
3	1½ in. malleable elbows.....	.21	.63
	Meter box, 4 ft. x 4 ft. x 3 ft.....		10.00
	Main connection.....		5.00
	Labour, team, and miscellaneous.....		26.00
	Total.....		\$265.18

7TH CONCESSION FARMERS' LINE

1	1 in. Crawford sensitive regulator.....		\$28.00
1	1 in. brass stop cock.....		1.03
3	1 in. nipples.....	\$0.07	.21
1	1 in. x ½ in. tee.....		.22
1	1 in. Dresser coupling.....		.63
1	1 in. brass stop cock.....		1.03
1	No. 1 Tobey meter.....		14.70
	Meter box.....		4.00
	Main connection.....		5.00
	Labour, team, and miscellaneous.....		8.00
	Total.....		\$62.82

8TH CONCESSION FARMERS' LINE

1	1 in. Crawford sensitive regulator.....		\$28.00
1	1 in. brass stop cock.....		1.03
1	1 in. x ½ in. tee.....		.22
1	1 in. lip union.....		.23
2	1 in. nipples.....	\$0.07	.14
	Main connection.....		5.00
1	No. 2 Tobey meter.....		28.80
1	1 in. malleable elbow.....		.16
1	1 in. x ½ in. tee.....		.22
	Labour, team, and miscellaneous.....		10.00
	Total.....		\$73.80

9TH CONCESSION FARMERS' LINE

Quantity	Item	Unit cost	Reproduction cost ¹ new
1	1½ in. brass stop cock.....		\$2.24
2	1½ in. nipples.....	\$0.10	.20
2	2 in. x 1½ in. malleable reducers.....	.25	.50
2	2 in. nipples.....	.16	.32
1	2 in. x 1 in. malleable tee.....		.44
1	2 in. Crawford sensitive regulator.....		39.50
1	No. 4 Tobey meter.....		117.50
1	Bristol recording gauge and connection.....		68.00
	Meter box, 3 ft. x 3 ft. x 3 ft.....		8.60
1	1½ in. lip union.....		.41
	2 in. main connection.....		10.50
1	3 in. x 2 in. Dresser saddle.....		2.03
	Labour, team, and miscellaneous.....		28.00
	Total.....		\$278.24

HIGH PRESSURE LINE AND REGULATOR AT MILL, MERLIN

1	2 in. high pressure Chaplin-Fulton regulator.....		\$71.80
1	2 in. high pressure gate valve.....		14.00
1	2 in. heavy cast elbow.....		.58
3	2 in. malleable tees.....	\$0.44	1.32
7	2 in. nipples.....	.16	1.12
3	2 in. x 1 in. bushings.....	.11	.33
2	1 in. brass stop cocks.....	1.03	2.06
1	1 in. Dresser coupling.....		.63
2	2 in. flange unions.....	.81	1.62
2	1 in. nipples.....	.07	.14
	2 in. main line connection.....		10.50
	Labour, team, and miscellaneous.....		15.00
	Total.....		\$119.10

MERLIN TILEYARD LINE AT YARD

2	2 in. brass stop cocks.....	\$3.35	\$6.70
1	2 in. heavy cast elbow.....		.58
2	2 in. malleable elbows.....	.33	.66
1	2 in. malleable street elbow.....		.37
4	3 in. x 2 in. swedge nipples.....	1.18	4.72
4	2 in. nipples.....	.16	.64
1	3 in. heavy cast elbow.....		1.53
1	3 in. heavy cast flange union.....		1.82
1	3 in. malleable tee.....		1.10
1	3 in. plug.....		.20
2	4 in. x 3 in. swedge nipples.....	1.57	3.14
14	3 in. nipples.....	.43	6.02
4	3 in. malleable tees.....	1.10	4.40
2	3 in. high pressure gate valves.....	18.60	37.20
1	2 in. low pressure gate valve.....		8.00
1	3 in. Dresser line sleeve.....		3.19
1	3 in. Dresser coupling.....		1.67
1	2 in. Dresser coupling.....		1.26

MERLIN TILEYARD LINE AT YARD—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	2 in. heavy cast tee.....		\$0.73
1	3 in. x 1 in. heavy cast bushing.....		.30
4	3 in. elbows, malleable.....	\$0.81	3.24
2	3 in. x 2½ in. bushings.....	.23	.46
1	2 in. Chaplin-Fulton low pressure regulator.....		71.80
1	No. 25 Westinghouse oil meter.....		214.50
1	Mercury gauge and connection.....		4.50
8 ft.	4 in. pipe.....	.62	4.96
	Building, 12 ft. x 6 ft. x 6 ft.....		46.08
	Labour, team, and miscellaneous.....		40.00
	Total.....		\$469.77

MERLIN BOOSTER

1	1 in. Chaplin-Fulton low pressure regulator.....		\$36.00
1	1 in. brass stop cock.....		1.03
2	1 in. lip unions.....	\$0.23	.46
3	1 in. nipples.....	.07	.21
1	2 in. x 1 in. malleable reducer.....		.25
	Labour, team, and miscellaneous.....		7.00
	Total.....		\$44.95

KIMBALL LINE REGULATOR

1	Main connection.....		\$5.00
1	1 in. brass stop cock.....		1.03
1	1 in. Field regulator.....		22.50
1	1 in. x ½ in. tee.....		.22
1	½ in. brass stop cock.....		.45
1	No. 1 Tobey meter.....		14.70
4	1 in. nipples.....	\$0.07	.28
1	1 in. malleable elbow.....		.16
30 ft.	Meter box.....		3.00
	1 in. pipe.....	.10	3.00
	Labour, team, and miscellaneous.....		8.00
	Total.....		\$58.34

MANSELL LINE REGULATOR

1	Young B regulator.....		\$35.00
1	No. 3 Tobey meter.....		47.00
1	2 in. x 1½ in. malleable reducer.....		.25
1	1 in. brass stop cock.....		1.03
2	1 in. malleable elbows.....	\$0.16	.32
3	1 in. nipples.....	.07	.21
1	1 in. lip union.....		.23
20 ft.	1 in. pipe.....	.10	2.00

MANSELL LINE REGULATOR—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
	Main line connection.....		\$5.00
	Meter box.....		3.00
	Labour, team, and miscellaneous.....		13.00
	Total.....		\$107.04

RICE LINE REGULATOR

1	1 in. brass stop cock.....		\$1.03
1	1 in. Field high pressure regulator.....		22.50
1	1 in. tee.....		.22
3	1 in. nipples.....	\$0.07	.21
1	No. 1 Tobey meter.....		14.70
	Meter box.....		5.00
30 ft.	1 in. pipe.....	.10	3.00
	Main connection.....		5.00
	Labour, team, and miscellaneous.....		8.00
	Total.....		\$59.66

FLETCHER LOW PRESSURE REGULATOR

	2 in. main connection.....		\$10.50
4	2 in. malleable tees.....	\$0.44	1.76
3	2 in. malleable elbows.....	.33	.99
1	2 in. malleable street elbows.....		.37
4	2 in. brass stop cocks.....	3.35	13.40
4	2 in. flange unions.....	.81	3.24
1	2 in. Dresser line sleeve.....		2.43
15	2 in. nipples.....	.16	2.40
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
1	2 in. low pressure Chaplin-Fulton regulator.....		71.80
1	Mercury gauge and connection.....		4.50
1	8 in. pipe oil seal and connection.....		20.00
19 ft.	2 in. pipe.....	.24	4.56
	Building, 8 ft. x 10 ft. x 7 ft.....		49.30
	Labour, team, and miscellaneous.....		30.00
	Total.....		\$287.05

FLETCHER TILEYARD REGULATOR

3	3 in. heavy cast elbows.....	\$1.53	\$4.59
3	3 in. x 2 in. heavy cast tees.....	2.43	7.29
1	3 in. heavy cast tee.....		2.43
1	3 in. high pressure gate valve.....		18.60
1	3 in. low pressure gate valve.....		11.20
7	3 in. nipples.....	.43	3.01
1	3 in. x 2 in. swedge nipple.....		1.18
1	3 in. Chaplin-Fulton high pressure regulator.....		126.00
1	3 in. Chaplin-Fulton low pressure regulator.....		126.00
1	2 in. brass stop cock.....		3.35

FLETCHER TILEYARD REGULATOR—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	2 in. high pressure gate valve.....		\$14.00
2	2 in. malleable elbows.....	\$0.33	.66
1	2 in. Dresser coupling.....		1.26
5	2 in. nipples.....	.16	.80
1	8 in. pipe oil seal and connection.....		20.00
1	8 in. x 2 in. saddle.....		4.40
1	6 in. cushion 8 ft. long, with caps.....	1.10	10.00
6 ft.	2 in. pipe.....	.24	1.44
8 ft.	3 in. pipe.....	.44	3.52
1	Pressure gauge and connection.....		7.00
1	Bristol recording gauge and connection.....		68.00
	Building, 10 ft. x 6 ft.....		60.00
2	No. 25 Westinghouse oil meters.....	214.50	429.00
4	3 in. malleable elbows.....	.81	3.24
2	3 in. x 2½ in. bushings.....	.23	.46
1	3 in. light pressure gate valve.....		11.20
3	3 in. nipples.....	.43	1.29
	Labour, team, and miscellaneous.....		98.00
	Total.....		\$1,037.92

CROMWELL AND McFADDEN LINE

1	1 in. Field high pressure regulator.....		\$22.50
3	1 in. brass stop cocks.....	\$1.03	3.09
5	1 in. malleable tees.....	.22	1.10
6	1 in. malleable elbows.....	.16	.96
2	½ in. brass stop cocks.....	.45	.90
2	No. 1 Tobey meters.....	14.70	29.40
1	Young B regulator.....		35.00
50 ft.	1 in. pipe.....	.10	5.00
	Main line connection.....		5.00
2	Boxes.....	3.00	6.00
	Labour, team, and miscellaneous.....		16.00
	Total.....		\$124.95

PORT ALMA, LAKE SHORE ROAD

4	6 in. x 6 in. heavy cast tees.....	\$9.72	\$38.88
2	6 in. high pressure gate valves.....	46.50	93.00
1	6 in. heavy cast flange union.....		4.86
1	3 in. high pressure gate valve.....		18.60
1	2 in. high pressure gate valve.....		14.00
1	6 in. x 3 in. swedge nipple.....		3.32
1	Steel tank, 4 ft. x 8 ft.....		250.00
35 ft.	6 in. pipe line.....	1.10	38.50
	Drip on Lake road on Northern line.....		106.00
	Labour, team, and miscellaneous.....		57.00
	Total.....		\$624.16

CHATHAM REGULATOR AND ORIFICE METER

Quantity	Item	Unit cost	Reproduction cost new
51 ft.	8 in. line pipe with Dresser couplings.....	\$1.50	{ \$76.50
1	8 in. tee.....		6.84
1	8 in. x 3 in. swedge nipple.....		20.30
1	3 in. gate valve.....		7.27
1	3 in. gate valve.....		18.60
126 ft.	8 in. pipe.....	1.50	189.00
1	8 in. separator drip.....		158.00
1	8 in. x 6 in. welded joint.....		3.40
1	8 in. No. 125 Jenkins gate valve.....		46.30
1	6 in. No. 125 Jenkins gate valve.....		29.20
1	6 in. Dresser line sleeve.....		7.20
1	10 in. heavy cast elbow.....		6.12
3	6 in. nipples.....	{ 1.74 1.10 }	5.22
120 ft.	6 in. pipe in bypass with Dresser couplings.....		150.00
2	6 in. heavy cast elbows.....	6.12	12.24
1	6 in. high pressure gate valve.....		46.50
2	6 in. nipples.....	1.74	3.48
108 ft.	18 in. steel dust trap.....	{ 4.00 6.00 }	462.00
4	18 in. Dresser couplings.....	9.45	37.80
8	8 in. welded joints.....	3.40	27.20
6 ft.	8 in. pipe.....	1.50	9.00
33 ft.	8 in. pipe to building.....	1.50	49.50
1	8 in. heavy cast elbow.....		6.12
1	8 in. nipple.....		3.60
1	8 in. Pratt & Cady gate valve.....		140.89
2	8 in. heavy cast tees.....	20.30	40.60
4	8 in. high pressure gate valves.....	140.89	563.56
2	8 in. Chaplin-Fulton high pressure regulators.....	400.00	800.00
4	8 in. heavy cast elbows.....	13.00	52.00
10	8 in. nipples.....	3.60	36.00
2	8 in. orifice flanges, plate and connections.....	59.00	118.00
2	Sets 6 in. cushions, 3 ft. each.....	1.10	10.00
35 ft.	8 in. pipe.....	1.50	52.50
1	8 in. x 1 in. saddle.....		4.37
1	1 in. nipple.....		.07
1	1 in. brass stop cock.....		1.03
1	8 in. light cast elbow.....		6.27
2	8 in. Dresser line sleeves.....	11.20	22.40
22 ft.	8 in. pipe.....	1.50	33.00
2	Sets Foxboro recording gauges, float type.....	276.00	552.00
1	Mercury gauge.....		4.50
1	Precision instrument recording gauge.....		68.00
1	5 in. pressure gauge.....		4.50
	Building, 24 ft. x 14 ft. x 8 ft.....		224.60
	Labour, team, and miscellaneous.....		610.00
	Total.....		\$4,725.68

GRAVEL ROAD LINE, REGULATOR AND METER

Quantity	Item	Unit cost	Reproduction cost new
2	3 in. heavy cast elbows.....	\$1.53	\$3.06
2	3 in. light cast elbows.....	1.00	2.00
1	3 in. light cast tee.....		1.00
2	3 in. Dresser couplings.....	1.67	3.34
6	3 in. nipples.....	.43	2.58
2	3 in. high pressure Chaplin-Fulton regulators.....	126.00	252.00
1	No. 50 Westinghouse oil meter.....		343.00
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. malleable elbow.....		.33
1	2 in. light cast tee.....		.38
1	2 in. ground seat Dart union.....		1.70
1	2 in. high pressure gate valve.....		14.00
2	2 in. nipples.....	.16	.32
10 ft.	2 in. pipe.....	.24	2.40
1	Pressure gauge and connection.....		7.00
1	Bristol recording gauge and connection.....		68.00
7 ft.	3 in. pipe.....	.44	3.04
	Building, 8 ft. x 4 ft. x 5 ft.....		24.30
	Labour, team, and miscellaneous.....		74.00
	Total.....		\$803.63

PORT ALMA REGULATOR

12	8 in. high pressure flanged gate valves.....	\$167.80	\$2,013.60
7	6 in. high pressure flanged gate valves.....	97.78	684.46
2	4 in. high pressure flanged gate valves.....	57.10	114.20
3	3 in. high pressure flanged gate valves.....	38.26	114.78
6	8 in. flanged elbows.....	14.40	86.40
3	8 in. flanged pipes, 5 ft. 7 in. long, with 2 single branches.....	33.50	100.50
1	8 in. flanged pipe, 12 ft. long, with 3 single branches.....		65.34
1	12 in. flanged pipe, 12 ft. long, with 3 single branches.....		108.36
3	6 in. heavy cast tees.....	12.60	37.80
4	8 in. heavy cast tees.....	18.00	72.00
3	3 in. heavy cast tees.....	7.20	21.60
2	4 in. heavy cast tees.....	8.10	16.20
8	6 in. heavy cast elbows.....	9.10	72.80
3	3 in. heavy cast elbows.....	4.50	13.50
2	12 in. heavy cast elbows.....	26.10	52.20
1	12 in. separator drip.....		165.00
2	6 in. separator drips.....	145.00	290.00
1	8 in. x 12 in. swedge nipple.....		18.07
2	8 in. orifice flanges, plate and connection.....	59.00	118.00
1	6 in. high pressure gate valve.....		46.50
1	8 in. high pressure gate valve.....		81.00
49 ft.	8 in. pipe to Windsor line.....	1.50	73.50
31 ft.	8 in. pipe to Chatham line.....	1.50	46.50
20 ft.	8 in. pipe used as Sarnia line to gate valve.....	1.50	30.00
20 ft.	8 in. pipe to Sarnia line.....	1.50	30.00
20 ft.	12 in. pipe to Sarnia line.....	3.50	70.00
42 ft.	12 in. pipe to field lines.....	3.50	147.00
27 ft.	6 in. pipe to field lines.....	1.10	29.70
44 ft.	3 in. pipe to low pressure Port Alma plant.....	.44	19.36
12	8 in. welded joints.....	3.40	40.80

PORT ALMA REGULATOR—*Continued*

Quantity	Item	Unit cost	Reproduction cost new
1	12 in. blind flange.....		\$7.56
1	8 in. blind flange.....		3.44
1	Set Foxboro gauges.....		276.00
1	No. 4 Tobey meter for Port Alma.....		117.50
2	No. 4 Tobey meters for machine shop.....	\$117.50	235.00
2	Young B regulators.....	35.00	70.00
2	8 in. cushions with 4 caps.....	1.50	16.00
1	1½ in. malleable tee.....		.33
2	1½ in. lip unions.....	.41	.82
1	1½ in. brass stop cock.....		2.24
3	2 in. malleable elbows.....	.33	.99
2	1½ in. malleable elbows.....	.21	.42
1	1½ in. malleable street elbow.....		.24
2	1 in. lip unions.....	.23	.46
2	1 in. brass stop cocks.....	1.03	2.06
4	¾ in. malleable elbows.....	.10	.40
1	¾ in. malleable tee.....		.15
1	¾ in. lip union.....		.15
2	1 in. lip unions.....	.23	.46
2	½ in. globe valves.....	1.73	3.46
12 ft.	1 in. pipe.....	.10	1.20
	House, 10 ft. x 12 ft., wood frame, wood lined, shingle roof.....		141.60
	Bolts and gaskets.....		50.00
	Labour, team, and miscellaneous.....		700.00
	Total.....		\$6,409.65

REGULATOR IN CONNECTION WITH FUEL LINE TO BOILER AND PUMP HOUSE

1	8 in. heavy cast tee.....		\$20.30
1	8 in. x 4 in. swedge nipple.....		6.37
1	8 in. x 3 in. swedge nipple.....		7.27
1	3 in. x 2 in. swedge nipple.....		1.18
2	3 in. high pressure gate valves.....	\$22.60	45.20
1	4 in. high pressure gate valve.....		27.80
2	3 in. nipples.....	.43	.86
2	2 in. tees, malleable.....	.44	.88
2	2 in. malleable street elbows.....	.37	.74
2	2 in. flange unions.....	.81	1.62
1	2 in. high pressure Chaplin-Fulton regulator.....		71.80
4	2 in. nipples.....	.16	.64
1	2 in. x 1 in. malleable reducer.....		.25
1	2 in. plug.....		.08
	House.....		5.00
	Labour, cartage, and miscellaneous.....		28.50
	Total.....		\$218.49

FUEL LINE AND BRADLEY REGULATOR

Quantity	Item	Unit cost	Reproduction cost new
1	3 in. heavy cast tee.....		\$2.43
1	3 in. high pressure O.W.S. gate valve.....		27.59
1	3 in. x 2 in. swedge nipple.....		1.18
1	2 in. Dart flange union.....		1.45
1	2 in. heavy cast tee.....		.73
1	2 in. plug.....		.08
2	2 in. nipples.....	\$0.16	.32
2	2 in. x 1½ in. malleable reducers.....	.25	.50
2	1½ in. nipples.....	.10	.20
1	1½ in. high pressure Emco regulator.....		71.00
20 ft.	3 in. pipe.....	.44	8.80
	Labour, cartage, and miscellaneous.....		17.15
	Total.....		\$131.43

TELEPHONE LINES

The Union Natural Gas Company own certain telephone lines and poles; the table below is a summary of these.

Line	Connections	Miles	Unit cost	Reproduction cost new
From Port Alma north.....	4 wires, cross-arms and poles..	1.93	\$725.00	\$1,399.25
Glenwood road to Windsor.....	2 wires, side-blocks and poles..	40.65	492.50	20,020.13
Comber.....	2 wires, side-blocks and poles..	4.05	177.50	718.87
Glenwood road east.....	2 wires, cross-arms and poles..	3.45	553.75	1,910.44
Town line to Merlin.....	2 wires, side-blocks and poles..	0.57	492.50	280.73
County road.....	2 wires, side-blocks and poles..	0.34	492.50	167.45
County road to Charing Cross.....	2 wires, side-blocks.....	8.91	177.50	1,581.53
Dover line.....	2 wires, side-blocks.....	3.90	422.30	1,646.97
18 instruments.....			35.00	630.00
Total.....				\$28,355.37

Original Cost

It is reasonable to apply the same factors as in other computations to arrive at the probable original cost of the telephone lines. As the lines were erected about 1914, the cost index number would be 100. To-day, it is about 190.

$$\text{The probable original cost} = \$28,355.37 \times \frac{100}{190} = \$14,923.90.$$

Depreciation

As the lines are operating fairly satisfactorily we do not suggest expenditures except to replace a few poles and fittings which are decayed.

The physical depreciation on telephone lines is about 5 per cent. per annum, that is a total of \$12,759.92.

The accrued retirement reserve of telephone lines will be in proportion to the time they have been in service to that period plus the remaining life of the field, and that is 9 years to 21 years.

On the straight line basis this would amount to \$12,152.00, and on a 5 per cent. sinking fund basis it would be about \$7,145.50.

SERVICES

We are informed that there are the following number of services and consumers:—

	Consumers	Estimated services
Blenheim.....	474	460
Belle River.....	155	150
Tecumseh.....	174	165
Comber.....	158	150
Tilbury.....	425	400
Dresden.....	522	500
Tupperville.....	50	50
Ridgetown.....	630	500
Essex.....	420	400
Courtright.....	130	125
Sombra.....	90	90
Brigden.....	140	140
	3,368	3,230
United lines, north of Thames.....	716	
do south do.....	99	
Ridgetown lines.....	383	2,030
Ridgetown-Chatham lines.....	84	
Chatham lines.....	522	
Northern lines.....	144	
Essex lines.....	350	
	2,326	
Total.....	5,694	5,260

The average connection consists of:—

1 3 in. x 1 in. saddle.....	\$1.50
1 1 in. brass stop cock.....	1.03
2 1 in. nipples, at 7 cents each.....	.14
2 1 in. ells, at 16 cents each.....	.32
25 ft. of 1 in. pipe, at 10 cents.....	2.50
Street box.....	1.00
Labour, team, and miscellaneous.....	7.01

\$13.50

As about only one-half of services have street boxes, we deduct..... .50

Average cost of reproduction new..... \$13.00

There are about 5,260 services which at \$13 each, makes the total cost of reproduction new, \$68,380.

Original Cost

Applying the same method of ascertaining the probable original cost of the services, we have

$$\$68,380 \times \frac{100}{192.5} = \$35,500.$$

Depreciation

The expenditure necessary to restore the services to normal operating efficiency, so far as we can judge, is small. The services are operating, and although we have not made a thorough examination of the same, we do not anticipate any necessity for expenditure in this regard.

The physical depreciation to date we estimate at 25 per cent., which is \$17,095.

The accrued retirement reserve on the same basis as in the other part of the plant, will be in proportion to the period which has elapsed since the installation, to the total life of the field.

On the straight line basis the reserve would be:

$$\$68,380 \times \frac{9}{21} = \$29,305.$$

On the 5 per cent. sinking fund basis, it would be:

$$\$68,380 \times 9 \times 0.02799 = \$17,229.$$

METERS AND REGULATORS ON CONSUMERS LINES

As already stated on page 212, there are 5,260 consumers and we take for granted that each consumer has one meter. By this standard there are:—

1,370	Iron clad meters,	No. 1,	installed at \$17.25.....	\$23,632.50
23	do	No. 2,	do 37.30.....	857.90
4	do	No. 3,	do 61.00.....	244.00
1,032	Canadian meters,	5 lbs.,	do 14.90.....	15,376.80
331	do	10 lbs.,	do 17.45.....	5,775.95
21	do	20 lbs.,	do 28.40.....	596.40
5	do	30 lbs.,	do 41.00.....	205.00
1	Sprague meter,	No. 1,	do 15.00.....	15.00
6	do	No. 1a,	do 15.35.....	92.10
1	do	No. 4,	do 30.00.....	30.00
5	Westinghouse meters,	No. 5,	do 53.60.....	267.50
2	do	No. 8,	do 70.30.....	140.60
1	do	No. 25,	do 234.50.....	234.50
2	do	No. 50,	do 373.00.....	746.00
,750	Tobey meters,	No. 1,	do 17.70.....	30,975.00
26	do	No. 2,	do 32.80.....	852.80
4	do	No. 3,	do 53.00.....	212.00
36	do	No. 4,	do 127.50.....	4,590.00
640	do	No. a,	do 16.35.....	10,464.00
1	Emco,	No. 4,	do 120.00.....	120.00
<hr/>				
5,261	meters.....			\$95,428.05

Regulators

Apart from regulators in use at regulator stations, pumphouses on gas fields, etc., there are on consumers' lines:—

377	1 in. Chaplin-Fulton regulators,	installed at \$38.00.....	\$14,326.00
9	2 in. do	do 75.00.....	675.00
966	1½ in. improved regulators,	do 75.00.....	72,450.00
18	1 in. Mercury Seal regulators,	do 14.00.....	252.00
37	Young B regulators,	do 37.00.....	1,369.00
14	1 in. service regulators,	do 13.65.....	191.10
2	1 in. Crawford sensitive regulators,	do 30.00.....	60.00
1	2½ in. do	do 33.00.....	33.00
1	2 in. do	do 42.00.....	42.00
1	Field regulator,	do 24.50.....	24.50
4	1 in. Emco regulators,	do 45.00.....	180.00

1,430	Regulators.....	\$89,602.60
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In addition to the foregoing there are the following regulators owned by consumers:—

200	1 in. Chaplin-Fulton regulators.
3	2 in. do
6	1½ in. improved regulators.
29	Young B regulators.
1	Service regulator.
1	Little Grant regulator.

240 Regulators.

These are not included in the appraisal.

Original Cost

The probable original cost of these meters and regulators can be computed on the basis of the relative cost index numbers of 100 for 1913 and previous years and of about 192.5 for July last.

Meters.....	\$95,428.05
Regulators.....	89,602.60
Total reproduction cost new.....	\$185,030.65
Probable original cost.....	$\$185,030.65 \times \frac{100}{192.5} = \$96,270.00$

We have no suggestion to make as to the expenditures necessary to restore the above domestic meters and regulators to normal operating efficiency.

With regard to physical depreciation of the meters and regulators, we consider this to be four per cent. per annum, and we estimate that these meters and regulators have been in use eight years. Consequently the depreciation will be 32 per cent. of \$185,030.65, or \$59,209.80.

The accrued retirement reserve, less a residual value of 25 per cent. of the reproduction cost new, should be computed on the basis of eight years' service to that period plus the estimated remaining life of the gas fields, which as already stated is 12 years.

On the straight line basis the accrued retirement reserve would be:

$$\$138,773 \times \frac{8}{20} = \$55,509.$$

Or on a 5 per cent. sinking fund basis it would be:

$$\$138,773 \times 8 \times 0.03024 = \$33,572.$$

AUTOS, HORSES, VEHICLES, AND OTHER TRANSPORTATION EQUIPMENT

The following is a list of the autos, horses, vehicles, and other transportation equipment in hand on July 31st, last:—

Quantity	Item	Probable original cost	Depreciation	Reproduction cost new
CHATHAM				
1	2-ton Ruggles truck, 1922 model, pneumatic tires.....	\$3,000	\$500	\$2,500
2	1-ton Ford trucks, 1921 model, pneumatic tires...	1,540	830	1,430
1	½-ton light delivery truck, 1923 Ford, pneumatic tires.....	465	40	465
1	Ford sedan, 1923 model.....	865	175	760
1	Ford touring car, 1921 model.....	750	335	585
2	Ford touring cars, 1919 models.....	1,550	745	1,170
1	Heavy trailer, pneumatic tires, to use with Ruggles truck, 1922.....	450	150	400
1	Light trailer, pneumatic tires, 1920, to use with Ford 1-ton truck.....	275	150	250
3	Dodge touring cars, 1923.....	4,125	.....	4,125
1	¾-ton Ruggles truck, 1923.....	1,425	25	1,425
WALLACEBURG				
1	Old buggy, in fair shape.....	90	70	120
2	Lumber wagons, in good condition.....	200	200	300
2	Horses.....	350	100	350
1	Set double harness.....	40	15	40
1	Set single harness.....	25	10	25
1	Truck.....	770	265	465
1	Ford touring car.....	750	435	585
TILBURY				
1	½-ton Ford truck, 1923, good.....	465	40	465
BLENHEIM				
1	½-ton Ford truck, 1917, fair.....	450	310	465
RIDGETOWN				
1	½-ton Ford commercial truck, 1923, good.....	465	50	465
1	Ford 1-ton truck, 1922, good.....	775	215	715
ESSEX				
1	Ford 1-ton truck, 1922.....	775	215	715
SARNIA				
1	Ford ½-ton truck, 1920, no starter.....	880	265	465
COURTRIGHT				
1	¾-ton Ruggles truck, 1923.....	1,425	25	1,425
PORT ALMA				
8	Horses.....	1,400	400	1,400
2	Heavy lumber wagons, second-hand, good.....	400	200	400
8	Open buggies, " ".....	800	600	1,000

AUTOS, HORSES, VEHICLES AND OTHER TRANSPORTATION
EQUIPMENT—*Continued*

Quantity	Item	Probable original cost	Depreciation	Reproduction cost new
<i>PORT ALMA—Continued</i>				
4	Light wagons, second-hand, good.....	\$400	\$300	\$480
1	Light cart, " ".....	100	25	100
1	Cutter, " ".....	70	25	75
1	Set light sleighs, " ".....	60	40	60
8	Sets single harness, " ".....	200	80	200
1	Ford 1-ton truck, 1922, good.....	775	215	715
1	Ford ½-ton truck, 1921, fair.....	770	250	465
1	Ford ½-ton truck, 1914, fair.....	500	365	465
1	New Ruggles 1¼-ton truck, 1923.....	2,200	200	2,200
1	Fordson tractor, 1922, good.....	450	175	475
1	Fordson tractor, 1921, ".....	450	225	475
1	Fordson tractor, 1920, ".....	965	325	475
1	Road grader, 1922.....	175	25	175
3	Wagon tanks, 10 barrels each.....	200	100	210
Totals.....		\$31,820	\$8,715	\$29,080

The probable original cost of these autos, horses, vehicles, etc., would be about \$31,820.

We consider that this equipment is about normal and, therefore, do not believe any expenditure will be of advantage so far as efficiency is concerned.

The physical depreciation of the equipment is estimated at \$8,715.

The accrued retirement reserve in this case, less a residual value of, say 20 per cent. of the reproduction cost new, should be based upon a lifetime of about five years, of which an average of two years has elapsed, and would therefore be \$9,305.00 on the straight line basis, and \$8,420.17 on a five per cent. sinking fund basis.

TOOLS AND MISCELLANEOUS EQUIPMENT

An inventory of the tools and equipment with the reproduction cost new of each item is given below.

The total cost is \$87,935.37.

The original cost of these tools and equipment may be estimated as slightly greater than the present reproduction cost new, and we appraise it at \$90,000.00.

The physical depreciation in this case, owing to the relatively short life of several items, is about 33 per cent., or \$29,312.00.

The accrued retirement reserve will be on the basis of eight years, four of which have expired. On the straight line method this would be \$43,968.00, and on a five per cent. sinking fund basis it would amount to \$36,827.18.

TOOLS AND EQUIPMENT

Quantity	Item	Reproduction cost new
CHATHAM		
3	2 ft. x 6 ft. 8 in. temper screw, new.....	\$423.00
2	1¾ in. screw and rains, complete, S. H.....	220.00
1	Northrup boiler regulator, S. H.....	41.50
1	Swivel wrench, 8¼ in. to 10 in., with 4½ in. x 5 in. plate.....	110.00
3	Combination sockets, with 2¾ in. x 3¾ in. joint, new.....	375.00
3	Horn sockets, with 2¾ in. x 3¾ in. joints.....	235.00
1	8 in. swedge with 3¼ in. x 4¼ in. joint.....	55.34
1	6⅝ in. bit, 4¼ in. joint.....	69.00
1	10 in. bit, ".....	146.00
4	8 in. bits, ".....	460.00
2	10 in. bits, ".....	356.00
3	Sets 5½ in. drilling jars, new, 2¾ in. x 3¾ in. joints.....	375.00
1	Set fishing jars, with 2 in. x ⅝ in. joint, new.....	120.00
1	Casing ripper, complete, with 2¾ in. x 3¾ in. joint, new.....	193.33
1	Drilling mill, 2¾ in. x 3¾ in., new.....	190.00
1	6⅝ in. bulldog casing spear, 2¾ in. x 3¾ in. joint, S.H.....	136.00
1	6⅝ in. bell socket, 2¾ in. x 3¾ in. joint.....	44.00
2	8¼ in. bell sockets, 2¾ in. x 3¾ in. joint.....	230.00
1	10 in. bell socket, 2¾ in. x 3¾ in. joint, S.H.....	200.00
12	New Era rope sockets, 2¾ in. x 3¾ in. joint, new.....	552.00
5	Wire line rope sockets, 2¾ in. x 3¾ in. joints, S.H.....	177.50
1	6⅝ in. oil swab, 2¾ in. x 3¾ in. joint, S.H.....	55.00
1	5⅞ in. casing cutter, S.H.....	39.00
1	6⅝ in. rope spear, 2⅝ in. x 3¾ in. joint, S.H.....	75.25
1	Latch jack, 2¾ in. x 3¾ in. joint.....	41.50
1	Tool bumper for manilla line, S.H.....	87.50
1	Set 5½ in. wrenches, 2 in set, 375 lbs. each, S.H.....	125.00
1	Clevis for 3-pole derrick, S.H.....	1.75
2	Sets slips for 8¼ in. slip socket.....	40.00
2	Rope knives.....	80.00
1	6⅝ in. casing swedge, 2¾ in. x 3¾ in. joint.....	45.00
1	Jam down socket, 2¾ in. x 3¾ in. socket, new.....	75.00
1	Set manilla rope clamps for temper screw.....	18.00
1	Set O.W.S. wire line clamp.....	14.00
2	10 in. bowls for 8¼ in. slip sockets.....	48.00
1	Set of 1-ton chain falls, Yale screw.....	60.00
1	10 in. full circle casing spear, Mapes.....	300.00
1	Babbitt ladle.....	2.50
1	Spudding ring.....	5.00
1	5⅞ in. casing spear.....	75.00
1	Substitute, 2¾ in. x 3¾ in. box, by 2 in. x 3 in. pin.....	26.00
1	Set bull tongs (O.W.S. backup tongs).....	100.00
2	Single blocks, steel, S.H.....	20.00
1	Double block 16 in. sheaves steel, S.H.....	60.00
3	⅞ in. x 12 ft. chains.....	42.00
17	Boxes and pins to weld on drilling stems, new.....	425.00
1,200 ft.	2¼ in. manilla rope, new.....	672.00
4	2½ in. x 90 ft. bull ropes, new.....	172.00
1	½ in. x 4,000 ft. sand line.....	360.00
1	Barrel John Mansville boiler compound.....	84.00
2	Forge handles, wood, new.....	3.00
8	Sledge handles, wood, new.....	4.00

TOOLS AND EQUIPMENT—Continued

Quantity	Item	Reproduction cost new
1	Set 60-ton O.W.S. hydraulic jacks, S.H.....	\$700.00
3	5-gallon carboys sulphuric acid.....	25.00
1	6 $\frac{5}{8}$ in. x 8 $\frac{1}{4}$ in. Mosher casing head, new.....	45.00
1	No. 2 Barrett jack and track, complete.....	85.00
1	Set Quinlan burners for boiler, new.....	35.00
2	3,500 ft. aluminum measuring lines, new.....	140.00
6	Sets slips for $\frac{3}{8}$ in. wire line, used in Mechling drilling clamps, new....	108.00
6	Sets 2 in. temper screw ball bearings, new.....	18.00
1	Set interchange boxes for 2 in. temper screws.....	15.00
2	Jaws for Swan underreamer, new.....	30.00
1	Never slip.....	10.00
3	Yokes, complete, for 2 in. temper screw.....	12.00
3	2 $\frac{1}{2}$ in. wrist pins.....	31.50
1	Page pump complete, new.....	35.00
2	Sets splicing needles, complete.....	7.00
9	Special hay fork pulleys.....	9.00
2	8 in. casing shoes.....	48.00
2	5 $\frac{3}{16}$ in. casing shoes, new.....	28.00
6	$\frac{7}{8}$ in. x 24 in. bolts.....	7.50
2	1 $\frac{1}{4}$ in. x 24 in. anchor bolts, with eyes.....	5.00
1	Set 2 in. drive clamp bolts.....	10.50
2	12 in. x 90 ft. friction belts, Dominion, new.....	320.00
3	Sets lagging for No. 2 National drilling machine.....	75.00
2	Friction pulleys with flanges, complete, for No. 2 National drilling machine.....	400.00
2	Crown pulleys for No. 2 National drilling machine.....	60.00
1	Moon generator for lighting system.....	300.00
2	Sets back brakes, wood, for National drilling machine.....	70.00
1	5 $\frac{1}{2}$ in. x 40 ft. stem, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. pin, 3 $\frac{1}{4}$ in. x 4 $\frac{1}{4}$ in. box.....	221.85
1	4 $\frac{1}{4}$ in. x 40 ft. stem, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. box and pin.....	149.80
1	Brake band, $\frac{1}{4}$ in. x 14 in. x 28 ft.....	25.00
1	4 in. x 26 in. steel cut gear wheel.....	60.00
1	7 in. x 28 in. steel cut gear wheel.....	95.00
1	2 in. x 4 $\frac{1}{2}$ in. pinion gear.....	6.00
1	2 in. x 6 in. pinion gear.....	9.00
PORT ALMA		
1	7 $\frac{1}{2}$ in. boiler, 25 ft. long, new.....	70.00
2	5 in. boilers, 25 ft. long, S.H.....	92.00
1	2 in. tubing spear.....	32.00
1	5 in. band wheel, shaft and flanges.....	100.00
1	Sand reel sheaves.....	10.50
3	45-horsepower boilers, S.H., two, 2 years old.....	3,600.00
	one, 3 months old.....	2,000.00
1	25-horsepower boiler, S.H., 4 years old.....	1,500.00
3	Sets boiler mounts (wheel).....	1,200.00
2	Band wheel shafts and flanges, S.H., old.....	150.00
1	6 $\frac{5}{8}$ in. x 60 ft. spud, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. joint.....	175.00
2	3 $\frac{1}{2}$ in. x 40 ft. stems, 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. joint.....	214.00
1	4 $\frac{1}{4}$ in. x 18 ft. stem, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. joint.....	97.00
2	6 $\frac{5}{8}$ in. wire line bumpers.....	174.00
1	5 $\frac{3}{16}$ in. x 12 ft. spud, 2 in. x 3 in. joint.....	50.00
1	Set 4 $\frac{1}{2}$ in. wrenches (drilling).....	100.00
1	Straight track, O.W.S.....	30.00

TOOLS AND EQUIPMENT—*Continued*

Quantity	Item	Reproduction cost new
1	4 in. x 22 ft. tubing spear, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. joint.....	\$40.00
1	2 in. x 20 ft. tubing spear.....	32.00
1	4 in. tubing spear, 2 in. x 3 in. joint.....	38.00
5	3 in. tubing spears, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. joint.....	250.00
1	Set drilling jars, 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. joint.....	100.00
2	Sets 5 $\frac{5}{8}$ in. bits, new, 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. joint.....	220.00
1	Set 8 in. bits, 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. joint.....	160.00
1	5 $\frac{5}{8}$ in. wire line bumper.....	87.50
1	Latch jack, 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. joint.....	41.50
1	16 in. spudding bit, 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. joint.....	160.00
1	Set 10 in. bits, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. joint.....	280.00
1	1 $\frac{3}{4}$ in. temper screw, complete.....	110.00
2	2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. pins to weld on stems, new.....	38.00
1	3 $\frac{1}{4}$ in. x 4 $\frac{1}{4}$ in. pins to weld on stems, new.....	26.00
1	Set 5 $\frac{5}{8}$ in. bits, 2 in. x 3 in. joint.....	100.00
1	Set 5 $\frac{5}{8}$ in. drilling jars, 2 in. x 3 in. joint.....	120.00
1	Set 3 in. wrenches (drilling rig).....	36.00
1	Fish tail socket, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. joint, Park Bros.....	150.00
2	5 $\frac{5}{8}$ in. casing rippers, new.....	386.66
1	No. 2 National drilling machine.....	2,400.00
1	12 in. x 12 in. O.W.S. drilling engine, S.H., good.....	800.00
1	Wye drilling engine (gasoline), 65-horsepower, 4-cylinder, 5 in. x 7 in., mounted on wheels, 2 years old.....	3,500.00
1	No. 4 Bessemer gasometer.....	12.00
1	Johnston Graham drilling machine, complete.....	3,000.00
1	10 in. x 90 ft. belt.....	150.00
1	Tool box, with tools complete, for drilling rig.....	100.00
1	3 $\frac{1}{2}$ in. x 40 ft. stem, 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. joint.....	107.00
1	5 in. x 25 ft. bailer.....	46.00
1	Chickering pump bailer.....	75.00
1	3 $\frac{3}{4}$ in. x 2,500 ft. drilling line, wire.....	425.00
1	3 $\frac{3}{4}$ in. x 2,500 ft. drilling line, wire.....	425.00
1	3 $\frac{3}{4}$ in. x 4,000 ft. drilling line, wire.....	680.00
1	3 $\frac{3}{4}$ in. x 300 ft. tubing line.....	51.00
2	1 in. sheave tubing blocks.....	10.00
3	3 in. tubing hooks.....	105.00
1	Centre rope spear.....	30.00
2	Sets 3 $\frac{1}{2}$ in. drilling wrenches, 150 lbs. each.....	88.00
1	1 $\frac{3}{4}$ in. temper screw.....	110.00
1	Set Mechling wire line clamps.....	100.00
1	Set 6 $\frac{1}{4}$ in. bits, 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. joint.....	140.00
1	Set 5 in. drilling jars, 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. joint.....	100.00
1	Substitute, from 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. box to 2 $\frac{1}{4}$ in. x 3 $\frac{1}{4}$ in. box.....	33.00
1	300-lb. anvil.....	42.00
1	Set Vulcan chain tongs.....	25.00
1	Set 3 in. elevators.....	52.00
1	Set 6 $\frac{1}{4}$ in. elevators.....	80.00
1	1 $\frac{1}{2}$ in. x 2,500 ft. sand line.....	225.00
2	15-ton lifting jacks.....	70.00
1	No. 2 National drilling machine.....	2,400.00
1	Extra mast leg, timber.....	25.00
1	12 in. x 12 in. O.W.S. drilling engine.....	800.00
1	7 $\frac{7}{8}$ in. x 2,500 ft. drilling line.....	600.00
1	1 $\frac{1}{2}$ in. x 2,500 ft. sand line.....	225.00

TOOLS AND EQUIPMENT—*Continued*

Quantity	Item	Reproduction cost new
1	7/8 in. x 300 ft. tubing line.....	\$72.00
1	Crane, complete, for drilling rig.....	60.00
1	Set of 1-ton chain falls.....	60.00
2	Swivel wrenches.....	220.00
1	Jack and track, complete.....	85.00
1	Set 5 1/2 in. wrenches, 375 lbs.....	125.00
1	Set 4 1/2 in. wrenches, 275 lbs.....	100.00
2	12 in. x 90 ft. belts.....	320.00
2	4 1/4 in. x 40 ft. stems, 2 3/4 in. x 3 3/4 in. joint.....	300.00
3	5 1/2 in. x 40 ft. stems, 3 1/4 in. x 4 1/4 in. box, by 2 3/4 in. x 3 3/4 in. pins...	666.00
1	9 in. x 20 ft. bailer.....	120.00
1	7 1/2 in. x 25 ft. bailer.....	70.00
3	6 5/8 in. bits, 2 3/4 in. x 3 3/4 in. joint.....	240.00
2	Sets 5 1/2 in. drilling jars, 2 3/4 in. x 3 3/4 in. joint.....	250.00
1	5 1/2 in. x 25 ft. bailer.....	50.00
1	2 in. x 200 ft. manilla cable.....	72.00
1	Set 10 in. bits, 3 1/4 in. x 4 1/4 in. pin.....	292.00
2	Sets 8 in. bits, 3 1/4 in. x 4 1/4 in. joint.....	460.00
1	Set 3-prong grabs, 2 3/4 in. x 3 3/4 in. joint.....	90.00
1	8 in. horn socket, 2 3/4 in. x 3 3/4 in. joint.....	85.00
1	6 5/8 in. friction socket.....	70.00
1	Moran sand pump, 6 in. x 7 in.....	75.00
1	Side rope knife, 2 3/4 in. x 3 3/4 in. joint.....	60.00
1	Set drive clamps.....	45.00
1	10 in. slip socket, 2 3/4 in. x 3 3/4 in. joint.....	215.00
2	Wire line bumpers.....	175.00
1	Rope knife sinker and jars, complete.....	65.00
2	Sets 6 5/8 in. casing elevators.....	170.00
1	Set 8 in. elevators.....	100.00
1	Set 3 in. elevators.....	52.00
2	3 in. hooks.....	70.00
2	Sets manilla rope clamps for temper screws.....	36.00
2	O.W.S. blowers.....	48.00
2	Stock pumps (boiler feed pumps).....	150.00
1	1 3/4 in. temper screw.....	110.00
1	Set Mechling wire line clamp.....	100.00
1	Iron forge.....	18.00
1	300-lb. anvil.....	42.00
12	Hayfork pulleys.....	12.00
50 ft.	1/4 in. chain.....	5.00
1	Tool box with tools.....	100.00
1	Barrett lifting jack.....	35.00
3	8-bbl. water tanks (new).....	60.00
DAWN		
1	1/2 in. x 2,500 ft. sand line.....	225.00
3	4 1/4 in. x 40 ft. stems, 2 3/4 in. x 3 3/4 in. joint.....	450.00
3	5 1/4 in. x 40 ft. stems, 2 3/4 in. x 3 3/4 in. joint, 3 1/4 in. x 4 1/4 in. box.....	624.00
1	5 1/2 in. x 25 ft. bailer.....	50.00
1	7 in. x 25 ft. bailer.....	65.00
1	Set 12 in. bits.....	480.00
1	Set 10 in. bits.....	356.00
1	Set 8 in. bits.....	230.00
1	Set 6 5/8 in. bits.....	138.00
1	Set drilling jars.....	125.00

TOOLS AND EQUIPMENT—*Continued*

Quantity	Item	Reproduction cost new
1	Set 5½ in. wrenches, 500 lbs.	\$150.00
1	8 in. slip socket	190.00
2	Rope sockets	71.00
1	Moran sand pump	75.00
1	Swivel wrench	110.00
1	Track and jack, complete	85.00
1	300-lb. anvil	42.00
1	2-prong grab	80.00
1	Rope spear	87.50
1	Friction socket	70.00
1	Bit axe, rope chopper	5.00
1	Set drive clamps	45.00
1	1 in. sheave block	5.00
1	Set manilla line clamps	18.00
1	Set Mechling wire line clamps, heavy	100.00
1	5 in. casing hook	150.00
1	Derrick stove	18.00
2	Casing wagons	90.00
1	Set Gealy chain tongs	35.00
1	Forge	18.00
1	Slack tub	4.00
1	45-horsepower boiler, O.W.S., 2 years old, good	1,800.00
1	10½ in. x 10 in. O.W.S. engine, 25-horsepower, 5 years old	765.00
1	12 in. x 90 ft. belt, rubber	150.00
1	Set Quinlan boiler burners	35.00
2	O.W.S. sight feed lubricators (2-qt. size)	36.00
1	Northrup boiler regulator	41.50
1	Star blower	24.00
1	Pyle National generator, electric	300.00
1	Combination pipe vice	7.50
1	Standard drilling rig, complete	4,000.00
1	Tool box and tools, complete	100.00
1	15-ton lifting jack	35.00
OIL SPRINGS		
1	No. 2 National drilling machine	2,400.00
1	¾ in. x 2,500 ft. wire drilling line	425.00
1	½ in. x 2,500 ft. wire sand line	225.00
1	¾ in. x 700 ft. wire casing line	119.00
1	4¼ in. x 40 ft. drilling stem, 2¾ in. x 3¾ in. joint	150.00
1	4¼ in. x 12 ft. fishing stem, 2¾ in. x 3¾ in. joint	90.00
1	No. 2 Barrett jack and track, complete	85.00
2	Wire line tool bumpers	175.00
1	Set 5½ in. wrenches, 500 lbs.	150.00
1	2 in. temper screw	141.00
1	Set Mechling wire line clamps	100.00
1	Set manilla rope clamps	18.00
1	6⅝ in. x 12 ft. spud, 2¾ in. x 3¾ in. joint	90.00
1	Set 6⅝ in. bits	125.00
3	10 in. bits	534.00
1	12 in. bit	240.00
1	Set 8 in. bits	230.00
1	Set 6¼ in. bits	138.00
1	Set 5⅞ in. bits	100.00
1	6⅝ in. friction socket	70.00

TOOLS AND EQUIPMENT—*Continued*

Quantity	Item	Reproduction cost new
1	6 $\frac{5}{8}$ in. rope spear.....	\$65.00
5	Rope sockets.....	230.00
1	Pipe vice.....	7.50
1	No. 3 blower, O.W.S.....	28.00
1	300-lb. anvil.....	42.00
2	Casing wagons.....	90.00
2	Single sheave casing blocks.....	76.00
2	3 in. casing hooks.....	70.00
1	Set 10 in. anchor clamps.....	12.00
1	Set 6 $\frac{5}{8}$ in. anchor clamps.....	10.00
1	Set 3 in. anchor clamps.....	7.00
1	Set 10 in. elevators.....	125.00
1	Set 8 in. elevators.....	100.00
1	Set 6 $\frac{5}{8}$ in. elevators.....	85.00
1	Iron forge.....	18.00
1	8-bbl. tank.....	20.00
1	Derrick stove.....	18.00
1	45-bbl. tank.....	60.00
2	Sets drilling jars.....	250.00
1	18 in. smokestack for 40-horsepower boiler, 40 ft., good.....	96.80
1	7 in. x 25 ft. bailer.....	65.00
DOVER TOWNSHIP		
1	Standard drilling rig, complete.....	4,000.00
1	45-horsepower boiler, O.W.S., 2 years old, good.....	1,800.00
1	Set Quinlan gas burners.....	35.00
1	2 in. Northrup boiler regulator.....	41.50
1	12 in. x 12 in. Ajax steam engine, 30-horsepower, 5 years old, good.....	800.00
1	12 in. x 90 ft. rubber belt.....	160.00
3	5 $\frac{1}{4}$ in. x 40 ft. stems, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. joint.....	624.00
2	4 $\frac{1}{4}$ in. x 40 ft. stems, 2 $\frac{3}{4}$ in. x 3 $\frac{3}{4}$ in. joint.....	300.00
1	Set fishing jars.....	150.00
2	Sets drilling jars.....	250.00
1	Set 5 $\frac{1}{2}$ in. wrenches, 500 lbs.....	150.00
1	Jack and track, complete.....	85.00
1	No. 3 blower, O.W.S.....	28.00
1	300-lb. anvil.....	42.00
1	Slack tub.....	4.00
1	Crane, complete.....	60.00
1	Set 1-ton chain falls.....	60.00
1	Swivel wrench.....	110.00
50	Fire bricks.....	6.00
2	Bull ropes, 2 $\frac{1}{2}$ in. x 90 ft.....	67.30
2	2 in. temper screws.....	282.00
1	Set Mechling wire line clamps.....	100.00
1	Set Manilla rope clamps.....	18.00
1	9 in. x 20 ft. bailer.....	120.00
1	7 in. x 25 ft. bailer.....	65.00
1	5 $\frac{1}{2}$ in. x 25 ft. bailer.....	50.00
1	5 $\frac{1}{2}$ in. x 40 ft. sectional bailer.....	70.00
1	Set 12 in. bits.....	480.00
1	Set 10 in. bits.....	292.00
1	Set 8 in. bits.....	230.00

TOOLS AND EQUIPMENT—*Continued*

Quantity	Item	Reproduction cost new
1	Set 6 $\frac{5}{8}$ in. bits.....	\$138.00
4	Rope sockets.....	184.00
1	8 in. x 8 ft. slip socket.....	200.00
2	8 in. x 5 ft. slip sockets.....	380.00
3	Rope spears.....	90.00
1	6 $\frac{5}{8}$ in. horn socket.....	78.37
1	8 in. horn socket.....	85.00
1	6 $\frac{3}{8}$ in. rasp.....	90.00
1	Wire line bumper.....	87.50
1	Bit ram.....	45.00
1	8 in. trip casing spear.....	200.00
1	6 $\frac{3}{8}$ in. casing spear.....	160.00
2	Substitutes, 3 $\frac{1}{4}$ in. x 4 $\frac{1}{4}$ in. pins.....	66.00
1	Set 100-ton hydraulic jacks.....	800.00
2	Sets 10 in. and 12 in. spiders, rings and 7 sets of slips to fit, from 10 in. to 3 in.....	600.00
2	Sets casing wagons (4).....	180.00
2	Sets drive clamps.....	90.00
2	3-sheave blocks.....	450.00
1	4-sheave block.....	250.00
2	5 $\frac{1}{2}$ in. casing hooks.....	280.00
1	3 $\frac{3}{4}$ in. x 700 ft. wire casing line.....	119.00
1	7 $\frac{7}{8}$ in. x 4,000 ft. wire drilling line.....	960.00
1	7 $\frac{7}{8}$ in. x 2,500 ft. wire drilling line.....	600.00
1	1 $\frac{1}{2}$ in. x 4,000 ft. wire sand line.....	360.00
1	1 $\frac{1}{2}$ in. x 2,500 ft. wire sand line.....	225.00
2	Sets Gealy chain tongs.....	70.00
1	Spudding shoe.....	8.00
1	Hand pump.....	12.50
1	Generator, electric.....	300.00
1	Set 10 in. elevators.....	125.00
2	Sets 8 in. elevators.....	200.00
1	Set 6 $\frac{3}{8}$ in. elevators.....	85.00
12	Special hay fork pulleys.....	12.00
1	18 in. x 16 ft. smokestack for 45-horsepower boiler.....	39.60
50 ft.	1 $\frac{1}{4}$ in. chain.....	5.00
1	Tool box and tools, complete.....	100.00
1	2 $\frac{1}{4}$ in. x 200 ft. manilla cable.....	72.00
1	12 in. x 12 in. drilling engine, O.W.S., 30-horsepower, 5 years old, good..	800.00
2	Sets 5 $\frac{1}{2}$ in. wrenches, 500 lbs.....	300.00
1	Set fishing jars.....	150.00
1	Oil swab, 6 $\frac{5}{8}$ in., complete.....	55.00
1	Extra rubber for 6 $\frac{5}{8}$ in. oil swab, 10 in. long.....	15.00
1	Set Mechling wire rope clamps.....	100.00
1	5 $\frac{1}{16}$ in. bulldog casing spear.....	75.00
1	5 $\frac{1}{16}$ in. swedge.....	48.00
1	5 $\frac{1}{16}$ in. spud.....	75.00
1	Set grate bars for 40-horsepower boiler.....	30.00
1	8 in. spud.....	100.00
1	6 $\frac{5}{8}$ in. Jones casing cutter, complete with extra blocks.....	200.00
1	Set 8 in. elevators.....	100.00
1	Set 6 $\frac{3}{8}$ in. elevators.....	85.00
1	Set 5 $\frac{1}{16}$ in. elevators.....	70.00
1	Set 4 in. elevators.....	60.00
3	No. 2 blowers, O.W.S.....	72.00
1	Spudding shoe.....	8.00

TOOLS AND EQUIPMENT—*Continued*

Quantity	Item	Reproduction cost new
1	Bit ram.....	\$45.00
1	8 in. horn socket.....	85.00
1	Hook for wire line.....	35.00
1	Rope socket.....	46.00
1	6 $\frac{5}{8}$ in. swedge.....	52.00
1	Set 4 in. drilling jars.....	75.00
1	Barrett jack and track, complete.....	85.00
1	Swan underreamer, complete.....	450.00
1	Latch jack.....	41.50
1	10 in. drive head.....	40.00
1	12 in. drive shoe.....	42.00
1	Tool box and tools, complete.....	100.00
25 lbs.	Babbitt.....	7.50
1	Set of cants and arms for set of bull wheels.....	60.00
1	21 in. x 30 ft. smokestack, new.....	78.00
1	300-lb. anvil.....	42.00
CHATHAM WAREHOUSE		
1	Tool box and tools, for drilling rig.....	100.00
1	8 $\frac{1}{4}$ in. spud.....	100.00
1	10 in. spud.....	125.00
1	3 in. tubing spear.....	50.00
1	3 in. elevator.....	26.00
1	2 in. elevator.....	20.00
1	12 in. x 8 ft. bit.....	300.00
1	Latch jack.....	41.50
1	6 $\frac{5}{8}$ in. horn socket.....	70.00
1	Temper screw.....	141.00
1	Set 6 $\frac{5}{8}$ in. bits.....	138.00
1	Set 2 in. lay tongs.....	12.00
1	Set 3 in. Crumbie tongs.....	12.00
1	Set Gealy chain tongs for large pipe.....	35.00
1	Spudding shoe.....	8.00
1	Collar socket.....	75.00
1	Casing block, 2 sheaves.....	200.00
1	Pyle National generator, electric.....	300.00
1	Wire line tool bumper.....	87.50
	Total.....	\$87,935.37

OFFICE AND GENERAL EQUIPMENT

The following is an inventory of the furniture and general equipment. The original cost, so far as could be ascertained, is given in the third column, and we have stated in the fourth column what we consider to be the reproduction cost new.

Quantity	Item	Probable original cost	Reproduction cost new
CHATHAM—MARKET STREET OFFICES			
Mr. McKee's Room			
1	Flat top desk, 54 in. x 32 in., quarter-cut oak.....	\$24.00	\$50.00
1	Flat top desk, 50 in. x 33 in., plain oak.....	24.00	38.00
1	Drawing board and two trestles, 7 ft. 6 in. x 3 ft.....	.....	30.00
1	Safe cabinet.....	317.69	317.69
1	Filing drawers, 14 ft. 6 in. x 3 ft.....	180.00	180.00
1	Small index drawers, 2 ft. 2 in. x 1 ft. 9 in.....	17.00	17.00
1	Electric fan.....	48.00	30.00
3	Swivel chairs.....	42.00	60.00
2	Ordinary chairs.....	.....	10.00
1	Stool.....	.....	2.00
1	Remington typewriter.....	147.25	150.00
1	Typewriter desk, 50 in. x 30 in., 2 side drawers.....	50.00	50.00
Mr. Moore's Room			
1	Oak table, quarter-cut oak, 3 ft. 6 in. x 6 ft.....	127.25	120.00
	with glass top.....	35.00	
1	Roll-top desk, 2 ft. 10 in. x 4 ft. 8 in.....	77.00	80.00
2	Sets sectional bookcases, 3 shelves in each.....	78.00	66.00
1	Swivel chair.....	24.64	20.00
3	Arm chairs.....	45.00	45.00
1	Ordinary chair.....	12.00	12.00
1	Hat and coat rack.....	6.75	6.75
Messrs. Steele and Bevan's Room			
2	Roll-top desks, 2 ft. 4 in. x 4 ft. 6 in. and 2 ft. 8 in. x 4 ft. 8 in., one cost.....	75.00	160.00
1	Small flat top desk, 3 ft. 6 in. x 2 ft. 8 in., plain oak.....	38.00	28.00
2	Flat top desks, 2 ft. 10 in. x 4 ft. 2 ft. 8 in. x 5 ft. 10 in. }.....	66.00	{ 60.00
1	Set sectional bookcases, 3 shelves and drawer.....	34.50	35.00
2	Filing cabinets, 4 drawers each.....	80.00	72.00
2	Swivel chairs.....	27.00	40.00
3	Leather-seated chairs.....	36.00	45.00
1	Electric fan.....	48.00	30.00
Cashier's Room			
1	Flat top desk, 4 ft. 4 in. x 2 ft. 10 in.....	57.00	50.00
1	Coupon cutter.....	31.64	32.00
Mr. Oldershaw's Room			
1	Table, 4 ft. x 6 ft., plain oak.....	.....	30.00
1	Sectional bookcase, 3 shelves and drawer.....	34.50	35.00
1	Filing cabinet, 4 drawers.....	40.00	36.00
1	Swivel chair.....	13.00	20.00
2	Leather-seated chairs.....	24.00	30.00
1	Monroe calculator.....	375.00	375.00

OFFICE AND GENERAL EQUIPMENT—Continued

Quantity	Item	Probable original cost	Reproduction cost new
Stenographers' Room			
1	Mirror.....	\$5.50	\$5.50
1	Pine drafting table with trestle, 3 ft. x 4 ft. 8 in.....	22.99	25.00
5	Stenographer's desks, 2 side drawers each, three, 4 ft. 2 in. long one, 4 ft. " one, 4 ft. 6 in. " }	79.06	250.00
1	Stenographer's table, 1 ft. 7 in. x 3 ft.....		13.00
1	Flat top desk, 2 ft. 8 in. x 4 ft. 2 in.....	35.00	45.00
1	Flat top desk, 2 ft. 10 in. x 4 ft. 4 in.....	47.00	45.00
1	Table, 2 ft. 10 in. x 6 ft.....	41.75	42.00
1	Taylor safe.....		220.00
1	Scientist "B" cabinet safe.....	822.46	557.00
2	Filing cabinets (old).....	281.60	150.00
6	Remington typewriters—4 cost.....	597.50	900.00
1	Filing cabinet, foolscap size, 4 drawers.....	54.49	50.00
1	Addressograph, model F.....	404.95	405.00
1	Edison deck mimeograph, No. 78, Serial No. 25075.....	212.10	212.00
6	Swivel chairs.....	75.58	120.00
1	Stool.....		2.00
3	Ordinary chairs.....	12.00	15.00
3	Line-a-times.....	58.00	54.00
1	Chart rack.....	56.81	56.81
2	Electric fans.....	80.00	60.00
1	Cheque writer, model "R".....	84.00	84.00
1	Graphotype, model "G".....	185.00	185.00
1	Cabinet, 32 drawers.....	93.60	94.00
1	Weis postal scale.....	7.75	7.75
Ledger Room			
1	Typewriter desk, 1 set drawers, 2 ft. 6 in. x 3 ft. 6 in.....	52.00	54.00
1	Table, 3 ft. x 5 ft.....		35.00
1	Burroughs adding machine.....	401.80	395.00
1	Double ledger desk, 6 ft. x 4 ft. 9 in.....		80.00
1	Filing cabinet, Dick.....		50.00
2	Stools.....		4.00
1	Index filing drawers.....		20.00
1	Table, 1 ft. 9 in. x 1 ft. 4 in.....	8.36	10.00
9	Boxes rubber stamps.....	210.07	210.00
1	Electric fan.....	48.00	30.00
1	Swivel chair.....	17.25	20.00
1	Ordinary chair.....	4.00	5.00
1	Remington typewriter, No. 11.....	166.25	150.00
Lavatory			
1	Cupboard, 5 shelves, 3 ft. 3 in. x 7 ft. 6 in. x 1 ft. 5 in.....		35.00
1	Ordinary chair.....	4.00	5.00
1	Ice water tank, with connection.....	61.36	61.36
Stock room			
1	Deal table, 4 ft. x 2 ft. 6 in.....	9.00	9.00
3	Transfer filing cabinets, 4 drawers each.....	47.32	54.00
1	Cupboard, 10 ft. 3 in. x 3 ft. 10 in. x 2 ft.....		50.00
1	Small table, 1 ft. 8 in. x 2 ft. 4 in.....		5.00
1	Brown paper stand.....		5.00

OFFICE AND GENERAL EQUIPMENT—*Continued*

Quantity	Item	Probable Original cost	Reproduction cost new
1	Cupboard, 8 ft. 7 in. x 2 ft. x 9 ft. 9 in.	\$144.90	\$145.00
1	A-14-43 waste paper baler	15.00	15.00
160 ft.	Shelving		25.00
1	Typewriter	165.00	150.00
General			
	Cork linoleum, 18 ft. x 10 ft. 3 in.	62.97	647.39
	do 43 ft. x 23 ft.	341.21	
	do 31 ft. x 19 ft.	243.21	
2	Fire extinguishers	24.00	24.00
4	Single unit electric heaters	35.00	40.00
1	Double unit electric heater		15.00
1	Electric steam heater	25.00	25.00
1	Electric foot warmer	15.00	12.00
1	Table in entrance		15.00
MERLIN			
	Counter		20.00
1	Roll-top desk		60.00
1	Chair	9.00	10.00
PORT ALMA—FIELD OFFICE			
1	Roll-top desk		50.00
1	Chair	9.00	10.00
1	Table		15.00
1	Drafting table		15.00
1	Typewriter		150.00
TILBURY			
1	Taylor safe		220.00
1	Desk	24.00	25.00
2	Chairs		15.00
1	Remington typewriter		150.00
WALLACEBURG			
1	Taylor safe		220.00
1	Typewriter desk		40.00
1	Flat top desk		50.00
1	Roll-top desk		50.00
1	Remington typewriter		150.00
DRESDEN			
1	Safe, Goldie & McCulloch		220.00
1	Ledger desk		30.00
2	Chairs		15.00
1	Kitchen table		15.00
1	Work bench		50.00
	Partitions		70.00
1	Heater		25.00
SARNIA			
2	Desks		70.00
4	Chairs		30.00

OFFICE AND GENERAL EQUIPMENT—*Continued*

Quantity	Item	Probable original cost	Reproduction cost new
	WINDSOR		
1	Gas heater.....		\$25.00
	RIDGETOWN		
1	Roll-top desk, 36 in. x 26 in., oak.....		40.00
1	Table, 60 in. x 31 in., with drawer and shelf.....		30.00
1	Oak typewriter desk, 36 in. x 30 in., 3 drawers.....		50.00
1	Oak typewriter table, 30 in. x 30 in., 1 drawer.....		35.00
1	Oak desk stool.....		3.00
4	Oak chairs.....		40.00
1	Oak wall desk, 50 in. x 14 in.....		15.00
1	Taylor safe, 52 in. x 36 in. x 33 in.....		220.00
1	Ice water fountain.....		40.00
1	Gas heater, No. 135 Garnet Jewel.....		25.00
1	Heavy plate mirror.....		5.00
1	Electric fan, 10 in.....		30.00
1	Electric fan, 6 in.....		15.00
1	No. 5 Oliver typewriter.....		60.00
	Oak panelled partition, 20 ft. 5 in. x 7 ft., with 6 panes muronese glass, 34 in. x 26 in., and panel door.....		100.00
	DOVER		
1	Table.....		10.00
2	Chairs.....		5.00
	Total.....		\$10,944.25

Physical Depreciation

Some of the furniture and equipment was removed from Niagara Falls to Chatham, and other offices were similarly equipped with second-hand furniture. The average age of the furniture and equipment may be placed at six years, and the physical depreciation rate at five per cent. per year. This will amount to about \$3,283.28.

The remaining life of the field is estimated at about 12 years. The accrued retirement reserve for the six years which have elapsed, after deducting a residual value of 33 per cent. of the reproduction cost new, on the straight line basis would be \$2,432, and on a 5 per cent. sinking fund basis, \$1,556.

INTANGIBLES

We were instructed to consider and report upon the element of cost and value of:—

- (a) Engineering during construction.
- (b) Promotion, organization, administration and legal expenses prior to construction.
- (c) Administration and legal expenses during construction.
- (d) Insurance during construction.
- (e) Interest during construction.
- (f) Taxes during construction.

The appraisal of the intangible elements of an undertaking is involved in uncertainties, as each company will adopt its own methods of establishing a utility. The Pennsylvania Public Service Commission "as a general proposition is not disposed to allow, when estimating reproduction cost new, overhead expense during construction upon an arbitrary percentage basis, and finds that the overhead expense during construction might be anything from perhaps 16 per cent. to probably not less than 5 per cent., depending in part upon the class of professional services employed." (*Thayer, vs. Beaver Valley Water Company.*)

West Virginia Public Service Commission (January, 1922) allows actual investment on leasehold gas holdings, and stated in the Hope Natural Gas Company application, "that an allowance of a percentage for overhead costs would not be justifiable," but "it seems well established by the decisions of courts and commissions that in order to determine the value of property upon the basis of reproduction cost new, less depreciation, allowance must be made for these overhead costs, either by adding an estimate thereof to the known costs of labour and materials, or by a percentage addition to the aggregate cost of labour and materials. The latter course is usually followed."

The Missouri Public Service Commission in the Trenton Gas & Electric Company's case, stated that: "Construction overhead costs are controlled to a great extent by the lengths of the construction period, and by the efficiency of the organization in charge of the work. An allowance for construction overhead costs in one case does not constitute a precedent to be followed in every other case. The allowance in each instance should be governed by the condition surrounding the property under consideration."

In the report of the Alberta Public Utilities Commission for 1922, while discussing the application by the Northern Alberta Natural Gas Development Company, the commissioners stated that "it is undisputed in this case, and supported by precedents in similar cases, that it is proper that the promoters and developers of an enterprise of this kind are entitled to a reasonable reward for the time, energy and risk undertaken in the development of the same. There is a wide range of precedents as to the proper allowance for this purpose."

This natural gas company has undertaken a considerable preliminary development, and the supply is now being delivered into Edmonton. The

commissioners in their report presented statistics which, rearranged on a comparable basis for the purpose of this appraisal, were as follows:—

Cost of plant.....	\$2,744,747
Preliminary expense.....	75,338
Bond discount.....	760,532
	<hr/>
	\$3,580,617
Allowance for promotion, development, and financing, 10 per cent..	283,900
Engineering and supervision.....	50,000
Organization and administration, 1½ per cent.....	38,513
Interest during construction, 3 per cent.....	77,026
Omissions and contingencies, 2 per cent.....	51,351
Working capital.....	100,000
	<hr/>
Total.....	\$4,181,407

In an estimate for a new plant it is usual to allow for omissions and contingencies. But it is not apparent why allowances should be made for omissions only in cases of established plants when a full inventory is made, for it is just as possible to overmeasure as it is to undermeasure.

In the following paragraphs we refer to a few more recent decisions with regard to overhead or intangible expenses.

Pennsylvania Public Service Commission.—An allowance was awarded the Beaver Valley Water Company of 10 per cent. on reproduction cost new of physical properties and 7 per cent. on land, for overhead; 3½ per cent. interest on all reproduction cost new including overhead.

The Ohio Valley Water Company was allowed 10 per cent. on reproduction cost new of construction items for engineering omissions and contingencies; 6 per cent. interest during construction for half-time on nearly all items; \$2,400 for general administration during construction. Depreciation was deducted in all cases.

New York Public Service Commission, (April, 1921), allowed the Adirondack Power and Light Corporation 12 per cent. of book costs on tangible property for intangibles, and in the case of Public Service Corporation, of Long Island (April, 1921), 15 per cent. on actual cost was allowed for overhead. Queensboro Gas and Electric Company was allowed 17 per cent. for overhead. Lockport Light, Heat and Power Company was allowed 20 per cent. (1918).

Michigan Public Utilities Commission (1921), in the case of Lansing Fuel and Gas Company, allowed 15 per cent. for overhead on book costs; Gratiot Gas Company, 15 per cent. on original cost; Michigan Light Company was allowed 15 per cent. on original cost.

Missouri Public Service Commission allowed St. Joseph Gas Company 15 per cent. on actual cost.

Hannibal Gas Company was allowed 16 per cent. on actual cost, excepting land on which 12 per cent. was allowed.

Kansas City Gas Company, in 1920, was allowed 10 per cent. for all intangible values on reproduction cost new, less depreciation.

Sedalia Water Company allowed $14\frac{1}{2}$ per cent. to cover engineering, interest during construction, taxes and insurance, legal expenses and contingencies.

Jefferson City Light, Heat and Power Company allowed 9 per cent. for overhead on land and 14 per cent. on remainder of the property.

Palmyra Telephone Company allowed 15 per cent. for organization, insurance, contingencies, interest during construction and engineering charges on telephone property.

Missouri Public Utilities Company allowed 17 per cent. for overhead charges on investment.

Ohio.—Columbus Railway and Light Company was allowed 8 per cent. for overhead cost by the District Court, and Lincoln Gas and Electric Company allowed 7.7 per cent.

Wisconsin Railroad Commission allowed 12 per cent. overhead on total inventory reproduction cost new to cover engineering superintendence, legal expenses, interest during construction and contingencies.

Illinois Public Utilities Commission allowed 12 per cent. in a telephone rate valuation.

Indiana.—Indianapolis Telephone Company allowed 12 per cent. for engineering, superintendence, and similar items.

Indianapolis Light and Heat Company allowed 13 per cent. for overhead on reproduction cost, less depreciation.

Home Telephone and Telegraph Company (1920), allowed 12 per cent.

Oregon Commission allowed 14 per cent. in some findings for construction cost.

West Virginia Public Service Commission allowed Hope Natural Gas Company (June, 1921), 20 per cent. overhead cost on reproduction value of property, less leasehold investment.

Bluefield Waterworks and Improvement Company (Sept., 1921), was "allowed 13 per cent. on reproduction cost new, less depreciation for overhead costs which, taking into consideration the piecemeal construction of this plant, seems liberal as many of such overhead costs such as engineering and superintendence, administration and legal and general contingent costs and interest during construction were in all likelihood included in operating costs and paid as such."

Considering now the overhead and intangible items entering into the Union Natural Gas Company's undertaking in the order given at the commencement of this discussion, we would respectfully suggest that the gas company should present evidence as to the expenditure incurred in this respect. The historical cost will, of course, include these items, but not in segregated form. We have, therefore, no information to use in this connection.

(a) *Engineering and supervision during construction.*—Having regard to the decisions given in other appraisal cases, we have provisionally assessed the cost of engineering and supervision on a percentage basis as follows:—

ENGINEERING AND SUPERVISION

	On reproduction cost new	On reproduction cost new, less accrued retirement reserve	On probable actual cost
1.0 per cent. on private rights of way and easements	\$145	\$83	\$145
1.0 " on buildings and lots.....	1,338	956	706
2.0 " on machinery.....	584	384	349
2.0 " on wells and equipment.....	28,783	18,727	22,668
5.0 " on compressor station.....	13,310	8,747	7,200
1.0 " on collecting lines.....	2,104	1,478	1,475
1.0 " on transmission lines.....	29,131	19,767	18,951
1.0 " on distribution lines.....	3,343	2,144	2,017
1.0 " on regulators and checking meters....	864	586	564
1.0 " on service meters and regulators.....	2,534	1,686	1,318
1.0 " on tools and equipment.....	8,794	4,397	9,000
1.0 " on telephone lines.....	283	161	149
Total engineering and supervision during construction	\$91,213	\$59,116	\$64,542

(b) *Promotion.*—The cost of promotion, organization, administration and legal expenses prior to construction can only be roughly estimated at \$15,000.

(c) *Administration and legal expenses during construction.*—This is also a difficult item to appraise. Assuming that the administration cost \$5,000 per year for two years and legal expenses amounted to \$15,000, then the total cost would be about \$25,000.

(d) *Insurance during construction.*—We have made enquiries as to what insurance rates would apply in this case. We find that in general, insurance costs ranged from 0.75 per cent. to about 3 per cent., depending upon whether the plant was being constructed or being operated. The rates for workmen's compensation in this province are 1.8 per cent. of the payroll, and that for public liability about 0.5 per cent. of the payroll. It would appear that to allow two and one-half per cent. of the payroll for all insurance would be fair. The total amount of this insurance is shown in the following tabulation:—

	On reproduction cost new	On reproduction cost new, less accrued retirement reserve	On probable actual cost
Buildings.....	$\$133,813 \times 0.40 \times 0.025 =$	\$1,338.10	\$955.80
Machinery.....	$29,235 \times 0.15 \times 0.025 =$	110.00	72.03
Wells and equipment.....	$1,439,161 \times 0.30 \times 0.025 =$	10,800.00	7,021.15
Compressor station.....	$266,200 \times 0.30 \times 0.025 =$	1,996.50	1,311.97
Pipe lines.....	$3,457,720 \times 0.20 \times 0.025 =$	17,288.60	11,694.65
Regulators and checking meters.	$81,399 \times 0.15 \times 0.025 =$	324.06	219.83
Telephone lines.....	$28,355 \times 0.15 \times 0.025 =$	106.30	60.76
Services.....	$68,380 \times 0.15 \times 0.025 =$	256.40	154.03
Meters and regulators.....	$185,030 \times 0.15 \times 0.025 =$	693.90	485.71
Total insurance during construction.....	\$32,913.80	\$21,975.93	\$22,327.21

(e) *Interest during construction.*—We consider that the interest which would have to be paid to-day in connection with capital required for the construction of the Union Natural Gas Company's plant would be about 7 per cent. We estimate that it would take about four years to drill the wells and two years to lay the mains, etc., but interest will be based on the average period.

	On reproduction cost new	On reproduction cost new, less accrued retirement reserve	On probable actual cost
7 per cent. interest on wells and equipment for 2 years.	\$201,482	\$131,089	\$158,680
7 per cent. interest on remainder for one year.....	460,860	346,804	249,901
Total interest during construction.....	\$662,342	\$477,893	\$408,581

(f) *Taxes during construction.*—We have analyzed the records of other undertakings to ascertain the relation of taxes to the cost of the work and find that it ranges from about 0.75 per cent. to 2.5 per cent. The cost basis, however, is sometimes the actual, sometimes the reproduction cost new, and sometimes the reproduction cost less depreciation. We consider one per cent. on the reproduction cost new to be ample.

1 per cent. taxes on reproduction cost new.....	\$80,229
do on reproduction cost new, less accrued retirement reserve	58,907
do on probable actual cost.....	47,035

SUMMARY OF INTANGIBLES

	On reproduction cost new	On reproduction cost new, less accrued retirement reserve	On probable actual cost
Engineering during construction.....	\$91,213	\$59,116	\$64,542
Promotion organization, administration and legal expenses prior to construction.....	15,000	15,000	15,000
Administration and legal expenses during construction	25,000	25,000	25,000
Insurance during construction.....	32,914	21,976	22,327
Interest during construction.....	662,342	477,893	408,581
Taxes during construction.....	80,229	58,907	47,035
Total.....	\$906,698	\$657,892	\$582,485

The physical depreciation of the plant is about 27 per cent. We apply, therefore, this factor to intangible expense. This is equivalent to \$244,808, in the case of the reproduction cost new.

The accrued retirement reserve for intangible expense based upon 9 years out of 21 years, would on a straight line theory equal \$388,585 and on a five per cent. sinking fund basis, would amount to \$228,448.

WORKING CAPITAL

The late D. R. Roberts in his examination of the company's books found that the average monthly operating expense, which included maintenance, gas and oil, income tax, business profit, and cost of dry wells during the years 1919 to 1922, was \$31,453. In 1922 the monthly operating expenses amounted to \$37,040. We have, however, allowed \$40,000 for cash working capital.

The stock in hand constitutes another item of the working capital. We had the stock checked, but as the stock-list covers over 100 foolscap pages and the material in hand changes daily, we have not considered it necessary to publish the items in detail. A copy of the stock list will be available for the Board of Reference. We have analyzed the items and segregated them as given below.

The total reproduction cost new of the stock amounts to \$348,540.41.

STOCK AS ON JULY 31st, 1923

		Essex	Blenheim	Chatham	Ridgetown	Port Alma
1.	Sleeves and couplings.....	\$740.19	\$517.08	\$2,512.30	\$752.12	\$7,866.85
2.	Valves.....	56.60	21.05	2,235.00	146.85	2,111.93
3.	Collar leak clamps.....	72.82	77.60	778.50	218.34	1,083.10
4.	Stops.....	54.46	58.61	379.70	92.36	191.15
5.	Cast iron fittings.....	208.64	364.70	4,051.77	560.01	2,991.65
6.	Saddles and collars.....	230.90	257.14	1,727.77	614.31	1,547.31
7.	Pipe.....	1,161.21	1,532.32	11,646.16	2,080.05	84,992.73
8.	Regulators.....	830.90	1,219.50	12,211.10	1,101.60	661.50
9.	Miscellaneous.....	834.39	513.97	9,270.09	752.40	8,451.35
10.	Gauges.....			7,421.93	175.00	
11.	Meters.....			68,725.15	60.00	
	Totals.....	\$4,190.11	\$4,561.97	\$120,959.47	\$6,553.04	\$109,903.57

STOCK AS ON JULY 31st, 1923—Continued

	Court-right	Sarnia	Tilbury	Wallace-burg	Dresden	Dover	Dawn and Oil Springs	Total
1.	\$29.22	\$1,214.72	\$186.79	\$2,195.88	\$135.54			\$16,150.69
2.	53.41	284.20	134.28	103.20	73.06	15.00	54.84	5,289.42
3.	4.80	288.61	301.40	3,422.58	28.24			6,275.99
4.	12.12	49.14	320.70	22.64	17.02		14.40	1,212.30
5.	118.31	281.93	361.52	605.71	118.99	5.13	14.57	9,682.93
6.	94.96	174.72	73.27	1,210.10	215.85			6,146.33
7.	300.17	32,908.76	1,393.02	3,908.39	752.51	35,558.27	8,854.42	185,094.01
8.	260.80	1,316.10	573.40		292.10			18,482.00
9.	214.22	970.70	907.82	1,386.68	393.24	57.00	72.80	23,824.66
10.								7,596.93
11.								68,785.15
	\$1,103.01	\$37,488.88	\$4,252.20	\$12,855.18	\$2,026.55	\$35,635.40	\$9,011.03	\$348,540.41

The materials in hand consist of several thousand items ranging in condition from new to almost scrap, and some of them have been in stock for a considerable time.

The bulk of these materials have been purchased since the incorporation of the company, but we have no information as to the quantity bought in each year. We can only assume that the original cost will be in proportion to the average cost index numbers for the past nine years, which is computed to be practically the same as that for July, 1923. Therefore, the original cost in this case will be about the same as the reproduction cost new, or \$348,540.

The physical depreciation of the materials in stock is about 50 per cent., or \$174,270.

The accrued retirement reserve can only be estimated on the assumption that ten years out of the total possible life of twenty years have expired, and we consider this apportionment to be fair under the circumstances. On the straight line basis, the accrued retirement will be about 50 per cent., or \$174,270.00; and on a five per cent. sinking fund basis, it would be $\$348,540.41 \times 10 \times 0.03024$, or \$105,398.62.

VALUE OF SERVICE

“Value of the service rendered the public, having regard to the value and convenience of natural gas as compared with other fuels.”

The present day commercial fuels offer a wide variety of choice, and while solid, liquid, and gaseous fuels each have their particular sphere of convenience and efficiency, probably gaseous fuel is in general the most efficient.

Natural gas is a unique fuel; it is a natural resource; it possesses high heat value; it is convenient for use, is easily controlled, and requires the minimum of labour on the part of the consumer.

The accepted standard on this continent for heat content of fuels is the British Thermal Unit, which, for brevity and convenience, will be referred to as B.t.u. This unit means the quantity of heat necessary to raise the temperature of one pound of water one degree Fahrenheit. One B.t.u. is the equivalent heat energy involved in raising one pound 772 feet, or 772 pounds one foot. The nominal heat values of different fuels are:—

Natural gas, Tilbury field.....	1,019.5	B.t.u. per cubic foot
do Haldimand field.....	997.5	do
do Welland field.....	1,009.2	do
Coal gas.....	400 to 600	do
Coal and water gas.....	400 to 600	do
Producer gas.....	150 to 250	do
Steam coal (anthracite).....	14,000	B.t.u. per pound
Bituminous coal.....	12,000	do
Average coal.....	13,000	do
Lignite.....	7,500	do
Peat, air dried.....	6,000	do
Wood.....	5,000	do
Gas coke.....	11,000	do
Electricity.....	3,411	B.t.u. per kw.-hr.
Gasoline.....	19,000	B.t.u. per pound
Kerosene (coal oil).....	18,000	do
Fuel oil (gas oil).....	19,000	do

The fact that natural gas contains about 1,000 heat units per cubic foot, or a town gas has, say, 500, or liquid fuels have about 19,000 B.t.u. per pound,

is not a conclusive index of their relative values. One gaseous fuel may be more efficient than another, or the B.t.u. in one gas may do more work than those in another gas. The best standard for comparison is the B.t.u. per cubic foot of the product of combustion.

All fuels have to receive a certain volume of air for efficient combustion. When the mixture of gas and air is ignited, heat is evolved, but the temperature of such heat before dissipation will not necessarily be proportional to the heat values in the original fuel. Research work is now being conducted by various gas interests on this continent, and it is found that blue-water gas containing only 310 B.t.u. has a more efficient product of combustion and a higher flame temperature than either natural gas, coal gas, or producer gas.

In the final analysis, the fuel which yields the maximum amount of heat service per dollar under proper conditions is the cheapest to use. The consumer is not much concerned about the high or low B.t.u. content of any fuel, but he is interested in its uniformity and reliability, and the cost of service. It will, therefore, be admitted that the value of gaseous fuels depends upon a number of factors, such as the B.t.u. of the products of combustion, flame temperatures, conditions of combustion, temperatures of unavoidable waste heat, uniformity of pressure and supply, design of the appliances used, and proper adjustment of gas and air for efficient combustion. Analogous conditions with regard to other fuels constitute important features of the value of service.

It is admitted that waste takes place in the use of all fuels. We have observed natural gas being used inefficiently. Solid fuels are wasted on all sides. Oil men admit that liquid fuels are often used extravagantly. Electricians recognize that electricity is used efficiently only under certain conditions. Coal gas is wasted by the consumers. The application of proper methods in the utilization of fuels has not yet become general, and the tendency is to disregard efficiency when fuel is cheap. The greatly increased cost of coal has impelled coal-gas engineers to make an intensive study of the use of low-grade gas, and it has been ascertained by scientific research and by experience that high B. .u. value is not the primordial requirement; but an optimum mixture is necessary to secure a complete, rapid, and efficient combustion at the burner head. A fully aerated flame, short and hot, with an effectual contact with the part of the upper cone where combustion is complete, is essential for high efficiencies.

Our desire in this connection has been to present authentic data on the relative value of natural gas and other fuels, but we have not succeeded as well as we anticipated. There seems to be a paucity of information as to actual experience. Some of the following notes have been collected from various sources, and the remainder has been prepared by us and is presented in the hope that it will serve the purpose intended.

The U.S. Department of the Interior (Bureau of Mines) had a number of kitchen tests made by the Department of Home Economics of the Ohio State University in 1917, as a part of the natural gas conservation programme. These tests were made under the careful supervision of capable officials to ascertain the relative cost of natural gas, coal oil, gasoline, and electricity for

cooking. The following table will give in concise form the summary of the results of B.t.u. consumed:—

RESULTS OF KITCHEN TESTS MADE BY THE DEPARTMENT OF HOME
ECONOMICS, OHIO STATE UNIVERSITY

	1,000 B.t.u. natural gas	12,000 B.t.u. soft coal	19,000 B.t.u. coal oil	19,000 B.t.u. gasoline	3,411 B.t.u. electricity
Breakfast for six.....	10,000	132,000	20,900	17,100	3,412
Luncheon for six.....	24,000	138,000	45,600	28,500	10,236
Dinner for six.....	22,000	93,600	43,700	20,900	5,800
Baking four loaves.....	10,000	78,000	7,980	8,360	3,412
Total B.t.u. consumed.....	66,000	441,600	118,180	74,860	22,860
Relative percentage efficiency based upon electric range at 100 per cent.....	34.7	5.18	19.35	30.50	100

While the electric range is not 100 per cent. efficient, we may assume it as such, in order to make comparisons between it and other ranges. If the electric range in ordinary practice has only 50 per cent. efficiency, then the other percentages will be reduced proportionately. An electric water heater will probably give 90 or 95 per cent. efficiency, because the element is immersed in water.

Basing our estimates on the above results we compute the relative cost of one million B.t.u. at Chatham prices, as follows:—

Natural gas, 50 cents per 1,000 cubic feet.....	\$1.44
Soft coal, \$13.00 per ton.....	10.44
Coal oil, 16 cents per gallon.....	6.12
Gasoline, 29 cents per gallon.....	6.88
Electricity, 1½ cents per kw.-hr.....	4.40

The U.S. Bureau of Standards in 1922 conducted a series of carefully supervised tests to determine the efficiency of gas of different qualities, and applied the heat to a vessel containing two quarts of water. The pressure was equal to a three-inch column of water. The following figures are taken at random from the report:—

B.t.u. in gas	Cu. ft. consumed	Total B.t.u.	B.t.u. in gas	Cu. ft. consumed	Total B.t.u.
608	2.33	1,420	453	3.24	1,466
557	2.64	1,470	448	3.26	1,460
549	2.66	1,460	401	3.58	1,440
505	2.91	1,470	352	4.18	1,470
491	2.98	1,465	297	4.96	1,470

Thermal efficiency ranged from 36 to 38 per cent.

It would be reasonable to expect that about 1.50 cubic feet of natural gas with 1,000 B.t.u. per cubic foot would give the same heat results as those mentioned above.

The average heating value of the air and gas mixture was about 180 B.t.u. The conclusions drawn by the U.S. Bureau of Standards were that efficiency

of utilization of manufactured gas is independent of the nominal heat unit per cubic foot in the gas, and that the value of the gas is directly proportional to its heating qualities for practical purposes. They also believe that this relation would hold for natural gas.

The director of the U.S. Bureau of Standards in reply to enquiries made by Mr. Harkness, stated:—

Regarding the relative value of service from natural and manufactured gas, we would say that we regard the value of either kind of fuel gas as proportional to the heating value, provided it is burned in appliances which are well suited to the gas being used.

The majority of our best appliances seem to have been designed for use with manufactured rather than with natural gas, and generally these appliances do not burn natural gas as efficiently as would an appliance which was properly designed for a gas of a higher heating value. There are appliances that are entirely suitable for use with natural gas, however, and in these appliances natural gas is probably of just as much value per heat unit as is manufactured gas.

We have no single set of data which exactly covers this question and such data are rather hard to obtain because efficiency of utilization depends so much upon the appliance used. A given appliance is generally much better suited to one gas than to the other and tests based upon a single appliance are, therefore, unfair to the gas to which it is adapted. A comparison between efficiencies obtained with various types of appliances with good adjustment for various gas supplies does indicate, however, that the value of service from one is as great as from the other. Good gas service in every case requires constant service conditions; especially does it require reasonably constant pressure. In this connection the natural gas companies have not been able to provide as constant a pressure as is customary with the utilities supplying manufactured gas. This has been a great cause for dissatisfaction with and inefficient use of natural gas.

Mr. S. S. Wyer, a well-known engineer, makes the following comparisons between natural gas and other fuels:—

	Total B.t.u.
1,000 cubic feet of natural gas.....	1,000,000
2,000 cubic feet of manufactured gas.....	1,000,000
200 pounds calcium carbide (acetylene).....	1,260,000
8 imperial gallons of gasoline.....	1,200,000
7 imperial gallons of kerosene.....	1,040,000
12 imperial gallons of alcohol.....	1,091,500
322 kw.-hr. electricity.....	1,100,000

We have computed the total number of B.t.u. furnished by the various fuels and it is evident that Mr. S. S. Wyer has compared these fuels on a B.t.u. basis, without regard to relative efficiencies of consumption.

The Ohio State University tested some ranges under different pressures, and it was found that the efficiencies obtained from natural gas were from 14 per cent. under 5 inch pressure, to 43 per cent. under 0.2 inch pressure.

Surface combustion methods appears to yield good results. A perfect mixture of gas and air in which the constituents are in a state of intimate neutral collision projected against areas of incandescent solids, produces reaction which is flameless and invisible. Perfect combustion is said to be obtained and the gas is entirely consumed, releasing the total available energy for service. Bone and McCourt applied this method to a steam boiler and claimed to have obtained about 95 per cent. thermal efficiency which is, of course, very high.

The Hydro-Electric Bulletin for September, 1923, quotes an interesting case where electric and gas baking ovens were tested in New York City, with electricity at 3 cents per kw.-hr. and manufactured gas at \$1.15 per thousand cubic feet. The electric oven cost about \$100 per month as compared with

\$45 per month in the case of the gas oven. The reviewer, however, stated that heat generated by a fuel is not the basis of comparison, but the heat actually utilized.

It is noticeable that United States Utility Commissioners are recognizing that the efficiency of gas utilization is not dependent on the calorific value of the fuel when used for ordinary commercial purposes.

Tests made in a Pennsylvania gas furnace under careful control gave 68.2 per cent. efficiency, but in a coal hot air furnace only 48.3 per cent. Mr. E. J. Stephany, of Pittsburg, calculated that one ton of coal having 13,000 B.t.u. per pound, consumed with 55 per cent. efficiency, was equal to 20,000 cubic feet of natural gas containing 1,000 cubic feet consumed at 75 per cent. efficiency.

The Iowa State College made tests with house heating furnaces and found the efficiency with local coal was from 42 to 65 per cent.

The U.S. Bureau of Mines recently made many tests as to the efficiency of house heating boiler furnaces under scientific control. It was found that with coke, 57 to 72 per cent. efficiency was obtained; with anthracite, 58 to 75 per cent.; and with bituminous coal, 49 to 64 per cent.

The heating of the Singer building in New York City with coal firing gave an over-all efficiency of 68 per cent., and with oil firing nearly 80 per cent.

Efficiency tests made of a powdered-coal firing of two Sterling steam boilers with super-heaters at St. Joseph, Mo., by the U.S. Bureau of Mines, gave an average of 78.8 per cent., while other tests at Milwaukee gave 7 to 8 per cent. higher results.

The performance of internal combustion engines is usually based upon 10,000 to 15,000 B.t.u. per H.P.H., and the thermal efficiencies are higher than steam engines. The U.S. Geological Survey made a large number of tests on gas and oil engines. The following are some of the results:—

Engine	Fuel	Brake H.P.	Thermal efficiencies	
			Per I.H.P.	Per B.H.P.
Westinghouse.....	Natural gas	606	28.6	25.5
Snow.....	Natural gas	595	29.4	23.7
Premier.....	Producer gas	368	33.7	25.7
Keorting.....	Producer gas	341	34.0	24.1
Westinghouse.....	Producer gas	500	30.1	25.2
Nurnkey.....	Blast furnace gas	1,186	33.9	28.2
Diesel.....	Oil	297	45.8	32.2

Under average conditions obtaining in households, factories, etc., the thermal efficiencies are not as high as reported above, although theoretically they should be the same.

We believe the following thermal efficiencies will be secured in ordinary practice:—

Natural gas.....	14 to 35	per cent. in kitchen ranges.
do	50 to 75	" " under boilers and special heating furnaces.
do	70 to 90	" " by surface combustion under boilers.
do	14 to 35	" " in furnaces ordinarily adapted for coal.
do	15 to 30	" " in gas engines.
Coal and water gas..	14 to 35	" " in kitchen ranges.
do	15 to 30	" " in gas engines.
do	70 to 90	" " with surface combustion.
Coal.....	3 to 15	" " in kitchen ranges.
do	35 to 75	" " under boilers, hand fired.
do	50 to 80	" " under steam boilers with mechanical stoker.
do	25 to 60	" " in furnace of heating plant.
Powdered coal.....	up to 80	" " under steam boilers.
Coke.....	50 to 75	" " under steam boilers with mechanical stoker.
do	30 to 50	" " under steam boiler, hand fired.
do	20 to 40	" " in furnace of heating plant.
Electricity.....	50 to 70	" " in kitchen ranges.
do	75 to 85	" " in motors.
do	75 to 95	" " in direct heating.
Fuel oil.....	15 to 30	" " in kitchen ranges.
do	50 to 80	" " under boilers.
do	15 to 25	" " in oil engines.

Subject to modifications already mentioned, the following table computed by us will indicate the relative cost of one million B.t.u. produced by various fuels used at different efficiencies (see page 241).

Fuel is often purchased with little regard to true economy and serviceableness. Comparison of one fuel with another is often made on the basis of price only, and at other times on both heat units and price. If we regard both coal and natural gas as 100 per cent. efficient, then the relation between coal containing 12,000 B.t.u. per pound at \$12 per ton and natural gas containing 1,000 B.t.u. per cubic foot at 50 cents per 1,000 cubic feet, would be $\frac{12,000 \times 2,000}{1,000}$; that is, 24,000 cubic feet of natural gas at 50 cents per thousand is equivalent to one ton of coal at \$12.

But as has already been suggested their respective efficiencies of consumption should be compared. For example, if the usual efficiency of coal in kitchen ranges is 5 per cent., and of natural gas, 20 per cent., then,

$$\frac{\text{Coal}}{\text{Gas}} = \frac{1,200 \times 1,000,000 \times 20}{50 \times 24,000,000 \times 5} = 1$$

That is, the cost of coal under this condition would be 4 times that of natural gas.

As another example, take manufactured gas with 500 B.t.u. costing \$1 per thousand cubic feet and natural gas with 1,000 B.t.u. at 50 cents per thousand cubic feet, and, say, 15 per cent. efficiency of both fuels. Then,

$$\frac{\text{Manufactured gas}}{\text{Natural gas}} = \frac{100 \times 1,000,000 \times 15}{50 \times 500,000 \times 15} = 1$$

That is to say, the cost of manufactured gas under these conditions and at the above price would be 4 times that of natural gas for the same service.

These examples could be multiplied to any extent.

OFFICE AND GENERAL EQUIPMENT

The following is an inventory of the furniture and general equipment. The original cost, so far as could be ascertained, is given in the third column, and we have stated in the fourth column what we consider to be the reproduction cost new.

Quantity	Item	Probable original cost	Reproduction cost new
CHATHAM—MARKET STREET OFFICES			
Mr. McKee's Room			
1	Flat top desk, 54 in. x 32 in., quarter-cut oak.....	\$24.00	\$50.00
1	Flat top desk, 50 in. x 33 in., plain oak.....	24.00	38.00
1	Drawing board and two trestles, 7 ft. 6 in. x 3 ft.....		30.00
1	Safe cabinet.....	317.69	317.69
1	Filing drawers, 14 ft. 6 in. x 3 ft.....	180.00	180.00
1	Small index drawers, 2 ft. 2 in. x 1 ft. 9 in.....	17.00	17.00
1	Electric fan.....	48.00	30.00
3	Swivel chairs.....	42.00	60.00
2	Ordinary chairs.....		10.00
1	Stool.....		2.00
1	Remington typewriter.....	147.25	150.00
1	Typewriter desk, 50 in. x 30 in., 2 side drawers.....	50.00	50.00
Mr. Moore's Room			
1	Oak table, quarter-cut oak, 3 ft. 6 in. x 6 ft.....	127.25	120.00
	with glass top.....	35.00	
1	Roll-top desk, 2 ft. 10 in. x 4 ft. 8 in.....	77.00	80.00
2	Sets sectional bookcases, 3 shelves in each.....	78.00	66.00
1	Swivel chair.....	24.64	20.00
3	Arm chairs.....	45.00	45.00
1	Ordinary chair.....	12.00	12.00
1	Hat and coat rack.....	6.75	6.75
Messrs. Steele and Bevan's Room			
2	Roll-top desks, 2 ft. 4 in. x 4 ft. 6 in. and 2 ft. 8 in. x 4 ft. 8 in., one cost.....	75.00	160.00
1	Small flat top desk, 3 ft. 6 in. x 2 ft. 8 in., plain oak.....	38.00	28.00
2	Flat top desks, 2 ft. 10 in. x 4 ft. 2 ft. 8 in. x 5 ft. 10 in. }.....	66.00	{ 60.00
1	Set sectional bookcases, 3 shelves and drawer.....	34.50	35.00
2	Filing cabinets, 4 drawers each.....	80.00	72.00
2	Swivel chairs.....	27.00	40.00
3	Leather-seated chairs.....	36.00	45.00
1	Electric fan.....	48.00	30.00
Cashier's Room			
1	Flat top desk, 4 ft. 4 in. x 2 ft. 10 in.....	57.00	50.00
1	Coupon cutter.....	31.64	32.00
Mr. Oldershaw's Room			
1	Table, 4 ft. x 6 ft., plain oak.....		30.00
1	Sectional bookcase, 3 shelves and drawer.....	34.50	35.00
1	Filing cabinet, 4 drawers.....	40.00	36.00
1	Swivel chair.....	13.00	20.00
2	Leather-seated chairs.....	24.00	30.00
	Monroe calculator.....	375.00	375.00

OFFICE AND GENERAL EQUIPMENT—Continued

Quantity	Item	Probable original cost	Reproduction cost new
Stenographers' Room			
1	Mirror.....	\$5.50	\$5.50
1	Pine drafting table with trestle, 3 ft. x 4 ft. 8 in.....	22.99	25.00
5	Stenographer's desks, 2 side drawers each, three, 4 ft. 2 in. long } one, 4 ft. " } one, 4 ft. 6 in. " }	79.06	250.00
1	Stenographer's table, 1 ft. 7 in. x 3 ft.....		13.00
1	Flat top desk, 2 ft. 8 in. x 4 ft. 2 in.....	35.00	45.00
1	Flat top desk, 2 ft. 10 in. x 4 ft. 4 in.....	47.00	45.00
1	Table, 2 ft. 10 in. x 6 ft.....	41.75	42.00
1	Taylor safe.....		220.00
1	Scientist "B" cabinet safe.....	822.46	557.00
2	Filing cabinets (old).....	281.60	150.00
6	Remington typewriters—4 cost.....	597.50	900.00
1	Filing cabinet, foolscap size, 4 drawers.....	54.49	50.00
1	Addressograph, model F.....	404.95	405.00
1	Edison deck mimeograph, No. 78, Serial No. 25075.....	212.10	212.00
6	Swivel chairs.....	75.58	120.00
1	Stool.....		2.00
3	Ordinary chairs.....	12.00	15.00
3	Line-a-times.....	58.00	54.00
1	Chart rack.....	56.81	56.81
2	Electric fans.....	80.00	60.00
1	Cheque writer, model "R".....	84.00	84.00
1	Graphotype, model "G".....	185.00	185.00
1	Cabinet, 32 drawers.....	93.60	94.00
1	Weiss postal scale.....	7.75	7.75
Ledger Room			
1	Typewriter desk, 1 set drawers, 2 ft. 6 in. x 3 ft. 6 in.....	52.00	54.00
1	Table, 3 ft. x 5 ft.....		35.00
1	Burroughs adding machine.....	401.80	395.00
1	Double ledger desk, 6 ft. x 4 ft. 9 in.....		80.00
1	Filing cabinet, Dick.....		50.00
2	Stools.....		4.00
1	Index filing drawers.....		20.00
1	Table, 1 ft. 9 in. x 1 ft. 4 in.....	8.36	10.00
9	Boxes rubber stamps.....	210.07	210.00
1	Electric fan.....	48.00	30.00
1	Swivel chair.....	17.25	20.00
1	Ordinary chair.....	4.00	5.00
1	Remington typewriter, No. 11.....	166.25	150.00
Lavatory			
1	Cupboard, 5 shelves, 3 ft. 3 in. x 7 ft. 6 in. x 1 ft. 5 in.....		35.00
1	Ordinary chair.....	4.00	5.00
1	Ice water tank, with connection.....	61.36	61.36
Stock room			
1	Deal table, 4 ft. x 2 ft. 6 in.....	9.00	9.00
3	Transfer filing cabinets, 4 drawers each.....	47.32	54.00
1	Cupboard, 10 ft. 3 in. x 3 ft. 10 in. x 2 ft.....		50.00
1	Small table, 1 ft. 8 in. x 2 ft. 4 in.....		5.00
1	Brown paper stand.....		5.00

OFFICE AND GENERAL EQUIPMENT—*Continued*

Quantity	Item	Probable Original cost	Reproduc- tion cost new
1	Cupboard, 8 ft. 7 in. x 2 ft. x 9 ft. 9 in.....	\$144.90	\$145.00
1	A-14-43 waste paper baler.....	15.00	15.00
160 ft.	Shelving.....		25.00
1	Typewriter.....	165.00	150.00
General			
	Cork linoleum, 18 ft. x 10 ft. 3 in.....	62.97	647.39
	do 43 ft. x 23 ft.....	341.21	
	do 31 ft. x 19 ft.....	243.21	
2	Fire extinguishers.....	24.00	24.00
4	Single unit electric heaters.....	35.00	40.00
1	Double unit electric heater.....		15.00
1	Electric steam heater.....	25.00	25.00
1	Electric foot warmer.....	15.00	12.00
1	Table in entrance.....		15.00
MERLIN			
	Counter.....		20.00
1	Roll-top desk.....		60.00
1	Chair.....	9.00	10.00
PORT ALMA—FIELD OFFICE			
1	Roll-top desk.....		50.00
1	Chair.....	9.00	10.00
1	Table.....		15.00
1	Drafting table.....		15.00
1	Typewriter.....		150.00
TILBURY			
1	Taylor safe.....		220.00
1	Desk.....	24.00	25.00
2	Chairs.....		15.00
1	Remington typewriter.....		150.00
WALLACEBURG			
1	Taylor safe.....		220.00
1	Typewriter desk.....		40.00
1	Flat top desk.....		50.00
1	Roll-top desk.....		50.00
1	Remington typewriter.....		150.00
DRESDEN			
1	Safe, Goldie & McCulloch.....		220.00
1	Ledger desk.....		30.00
2	Chairs.....		15.00
1	Kitchen table.....		15.00
1	Work bench.....		50.00
	Partitions.....		70.00
1	Heater.....		25.00
SARNIA			
2	Desks.....		70.00
4	Chairs.....		30.00

OFFICE AND GENERAL EQUIPMENT—*Continued*

Quantity	Item	Probable original cost	Reproduction cost new
WINDSOR			
1	Gas heater.....		\$25.00
RIDGETOWN			
1	Roll-top desk, 36 in. x 26 in., oak.....		40.00
1	Table, 60 in. x 31 in., with drawer and shelf.....		30.00
1	Oak typewriter desk, 36 in. x 30 in., 3 drawers.....		50.00
1	Oak typewriter table, 30 in. x 30 in., 1 drawer.....		35.00
1	Oak desk stool.....		3.00
4	Oak chairs.....		40.00
1	Oak wall desk, 50 in. x 14 in.....		15.00
1	Taylor safe, 52 in. x 36 in. x 33 in.....		220.00
1	Ice water fountain.....		40.00
1	Gas heater, No. 135 Garnet Jewel.....		25.00
1	Heavy plate mirror.....		5.00
1	Electric fan, 10 in.....		30.00
1	Electric fan, 6 in.....		15.00
1	No. 5 Oliver typewriter.....		60.00
	Oak panelled partition, 20 ft. 5 in. x 7 ft., with 6 panes muronese glass, 34 in. x 26 in., and panel door.....		100.00
DOVER			
1	Table.....		10.00
2	Chairs.....		5.00
	Total.....		\$10,944.25

Physical Depreciation

Some of the furniture and equipment was removed from Niagara Falls to Chatham, and other offices were similarly equipped with second-hand furniture. The average age of the furniture and equipment may be placed at six years, and the physical depreciation rate at five per cent. per year. This will amount to about \$3,283.28.

The remaining life of the field is estimated at about 12 years. The accrued retirement reserve for the six years which have elapsed, after deducting a residual value of 33 per cent. of the reproduction cost new, on the straight line basis would be \$2,432, and on a 5 per cent. sinking fund basis, \$1,556.

INTANGIBLES

We were instructed to consider and report upon the element of cost and value of:—

- (a) Engineering during construction.
- (b) Promotion, organization, administration and legal expenses prior to construction.
- (c) Administration and legal expenses during construction.
- (d) Insurance during construction.
- (e) Interest during construction.
- (f) Taxes during construction.

The appraisal of the intangible elements of an undertaking is involved in uncertainties, as each company will adopt its own methods of establishing a utility. The Pennsylvania Public Service Commission "as a general proposition is not disposed to allow, when estimating reproduction cost new, overhead expense during construction upon an arbitrary percentage basis, and finds that the overhead expense during construction might be anything from perhaps 16 per cent. to probably not less than 5 per cent., depending in part upon the class of professional services employed." (*Thayer, vs. Beaver Valley Water Company.*)

West Virginia Public Service Commission (January, 1922) allows actual investment on leasehold gas holdings, and stated in the Hope Natural Gas Company application, "that an allowance of a percentage for overhead costs would not be justifiable," but "it seems well established by the decisions of courts and commissions that in order to determine the value of property upon the basis of reproduction cost new, less depreciation, allowance must be made for these overhead costs, either by adding an estimate thereof to the known costs of labour and materials, or by a percentage addition to the aggregate cost of labour and materials. The latter course is usually followed."

The Missouri Public Service Commission in the Trenton Gas & Electric Company's case, stated that: "Construction overhead costs are controlled to a great extent by the lengths of the construction period, and by the efficiency of the organization in charge of the work. An allowance for construction overhead costs in one case does not constitute a precedent to be followed in every other case. The allowance in each instance should be governed by the condition surrounding the property under consideration."

In the report of the Alberta Public Utilities Commission for 1922, while discussing the application by the Northern Alberta Natural Gas Development Company, the commissioners stated that "it is undisputed in this case, and supported by precedents in similar cases, that it is proper that the promoters and developers of an enterprise of this kind are entitled to a reasonable reward for the time, energy and risk undertaken in the development of the same. There is a wide range of precedents as to the proper allowance for this purpose."

This natural gas company has undertaken a considerable preliminary development, and the supply is now being delivered into Edmonton. The

commissioners in their report presented statistics which, rearranged on a comparable basis for the purpose of this appraisal, were as follows:—

Cost of plant.....	\$2,744,747
Preliminary expense.....	75,338
Bond discount.....	760,532
	<hr/>
	\$3,580,617
Allowance for promotion, development, and financing, 10 per cent..	283,900
Engineering and supervision.....	50,000
Organization and administration, $1\frac{1}{2}$ per cent.....	38,513
Interest during construction, 3 per cent.....	77,026
Omissions and contingencies, 2 per cent.....	51,351
Working capital.....	100,000
	<hr/>
Total.....	\$4,181,407

In an estimate for a new plant it is usual to allow for omissions and contingencies. But it is not apparent why allowances should be made for omissions only in cases of established plants when a full inventory is made, for it is just as possible to overmeasure as it is to undermeasure.

In the following paragraphs we refer to a few more recent decisions with regard to overhead or intangible expenses.

Pennsylvania Public Service Commission.—An allowance was awarded the Beaver Valley Water Company of 10 per cent. on reproduction cost new of physical properties and 7 per cent. on land, for overhead; $3\frac{1}{2}$ per cent. interest on all reproduction cost new including overhead.

The Ohio Valley Water Company was allowed 10 per cent. on reproduction cost new of construction items for engineering omissions and contingencies; 6 per cent. interest during construction for half-time on nearly all items; \$2,400 for general administration during construction. Depreciation was deducted in all cases.

New York Public Service Commission, (April, 1921), allowed the Adirondack Power and Light Corporation 12 per cent. of book costs on tangible property for intangibles, and in the case of Public Service Corporation, of Long Island (April, 1921), 15 per cent. on actual cost was allowed for overhead. Queensboro Gas and Electric Company was allowed 17 per cent. for overhead. Lockport Light, Heat and Power Company was allowed 20 per cent. (1918).

Michigan Public Utilities Commission (1921), in the case of Lansing Fuel and Gas Company, allowed 15 per cent. for overhead on book costs; Gratiot Gas Company, 15 per cent. on original cost; Michigan Light Company was allowed 15 per cent. on original cost.

Missouri Public Service Commission allowed St. Joseph Gas Company 15 per cent. on actual cost.

Hannibal Gas Company was allowed 16 per cent. on actual cost, excepting land on which 12 per cent. was allowed.

Kansas City Gas Company, in 1920, was allowed 10 per cent. for all intangible values on reproduction cost new, less depreciation.

Sedalia Water Company allowed $14\frac{1}{2}$ per cent. to cover engineering, interest during construction, taxes and insurance, legal expenses and contingencies.

Jefferson City Light, Heat and Power Company allowed 9 per cent. for overhead on land and 14 per cent. on remainder of the property.

Palmyra Telephone Company allowed 15 per cent. for organization, insurance, contingencies, interest during construction and engineering charges on telephone property.

Missouri Public Utilities Company allowed 17 per cent. for overhead charges on investment.

Ohio.—Columbus Railway and Light Company was allowed 8 per cent. for overhead cost by the District Court, and Lincoln Gas and Electric Company allowed 7.7 per cent.

Wisconsin Railroad Commission allowed 12 per cent. overhead on total inventory reproduction cost new to cover engineering superintendence, legal expenses, interest during construction and contingencies.

Illinois Public Utilities Commission allowed 12 per cent. in a telephone rate valuation.

Indiana.—Indianapolis Telephone Company allowed 12 per cent. for engineering, superintendence, and similar items.

Indianapolis Light and Heat Company allowed 13 per cent. for overhead on reproduction cost, less depreciation.

Home Telephone and Telegraph Company (1920), allowed 12 per cent.

Oregon Commission allowed 14 per cent. in some findings for construction cost.

West Virginia Public Service Commission allowed Hope Natural Gas Company (June, 1921), 20 per cent. overhead cost on reproduction value of property, less leasehold investment.

Bluefield Waterworks and Improvement Company (Sept., 1921), was "allowed 13 per cent. on reproduction cost new, less depreciation for overhead costs which, taking into consideration the piecemeal construction of this plant, seems liberal as many of such overhead costs such as engineering and superintendence, administration and legal and general contingent costs and interest during construction were in all likelihood included in operating costs and paid as such."

Considering now the overhead and intangible items entering into the Union Natural Gas Company's undertaking in the order given at the commencement of this discussion, we would respectfully suggest that the gas company should present evidence as to the expenditure incurred in this respect. The historical cost will, of course, include these items, but not in segregated form. We have, therefore, no information to use in this connection.

(a) *Engineering and supervision during construction.*—Having regard to the decisions given in other appraisal cases, we have provisionally assessed the cost of engineering and supervision on a percentage basis as follows:—

ENGINEERING AND SUPERVISION

	On reproduction cost new	On reproduction cost new, less accrued retirement reserve	On probable actual cost
1.0 per cent. on private rights of way and easements	\$145	\$83	\$145
1.0 " on buildings and lots.....	1,338	956	706
2.0 " on machinery.....	584	384	349
2.0 " on wells and equipment.....	28,783	18,727	22,668
5.0 " on compressor station.....	13,310	8,747	7,200
1.0 " on collecting lines.....	2,104	1,478	1,475
1.0 " on transmission lines.....	29,131	19,767	18,951
1.0 " on distribution lines.....	3,343	2,144	2,017
1.0 " on regulators and checking meters....	864	586	564
1.0 " on service meters and regulators.....	2,534	1,686	1,318
1.0 " on tools and equipment.....	8,794	4,397	9,000
1.0 " on telephone lines.....	283	161	149
Total engineering and supervision during construction	\$91,213	\$59,116	\$64,542

(b) *Promotion.*—The cost of promotion, organization, administration and legal expenses prior to construction can only be roughly estimated at \$15,000.

(c) *Administration and legal expenses during construction.*—This is also a difficult item to appraise. Assuming that the administration cost \$5,000 per year for two years and legal expenses amounted to \$15,000, then the total cost would be about \$25,000.

(d) *Insurance during construction.*—We have made enquiries as to what insurance rates would apply in this case. We find that in general, insurance costs ranged from 0.75 per cent. to about 3 per cent., depending upon whether the plant was being constructed or being operated. The rates for workmen's compensation in this province are 1.8 per cent. of the payroll, and that for public liability about 0.5 per cent. of the payroll. It would appear that to allow two and one-half per cent. of the payroll for all insurance would be fair. The total amount of this insurance is shown in the following tabulation:—

	On reproduction cost new	On reproduction cost new, less accrued retirement reserve	On probable actual cost
Buildings.....	$\$133,813 \times 0.40 \times 0.025 =$ \$1,338.10	\$955.80	\$705.60
Machinery.....	$29,235 \times 0.15 \times 0.025 =$ 110.00	72.03	57.94
Wells and equipment.....	$1,439,161 \times 0.30 \times 0.025 =$ 10,800.00	7,021.15	8,500.00
Compressor station.....	$266,200 \times 0.30 \times 0.025 =$ 1,996.50	1,311.97	1,080.06
Pipe lines.....	$3,457,720 \times 0.20 \times 0.025 =$ 17,288.60	11,694.65	11,221.55
Regulators and checking meters.	$81,399 \times 0.15 \times 0.025 =$ 324.06	219.83	211.10
Telephone lines.....	$28,355 \times 0.15 \times 0.025 =$ 106.30	60.76	56.15
Services.....	$68,380 \times 0.15 \times 0.025 =$ 256.40	154.03	133.10
Meters and regulators.....	$185,030 \times 0.15 \times 0.025 =$ 693.90	485.71	361.01
Total insurance during construction.....	\$32,913.80	\$21,975.93	\$22,327.21

(e) *Interest during construction.*—We consider that the interest which would have to be paid to-day in connection with capital required for the construction of the Union Natural Gas Company's plant would be about 7 per cent. We estimate that it would take about four years to drill the wells and two years to lay the mains, etc., but interest will be based on the average period.

	On reproduction cost new	On reproduction cost new, less accrued retirement reserve	On probable actual cost
7 per cent. interest on wells and equipment for 2 years.	\$201,482	\$131,089	\$158,680
7 per cent. interest on remainder for one year.....	460,860	346,804	249,901
Total interest during construction.....	\$662,342	\$477,893	\$408,581

(f) *Taxes during construction.*—We have analyzed the records of other undertakings to ascertain the relation of taxes to the cost of the work and find that it ranges from about 0.75 per cent. to 2.5 per cent. The cost basis, however, is sometimes the actual, sometimes the reproduction cost new, and sometimes the reproduction cost less depreciation. We consider one per cent. on the reproduction cost new to be ample.

1 per cent. taxes on reproduction cost new.....	\$80,229
do on reproduction cost new, less accrued retirement reserve	58,907
do on probable actual cost.....	47,035

SUMMARY OF INTANGIBLES

	On reproduction cost new	On reproduction cost new, less accrued retirement reserve	On probable actual cost
Engineering during construction.....	\$91,213	\$59,116	\$64,542
Promotion organization, administration and legal expenses prior to construction.....	15,000	15,000	15,000
Administration and legal expenses during construction	25,000	25,000	25,000
Insurance during construction.....	32,914	21,976	22,327
Interest during construction.....	662,342	477,893	408,581
Taxes during construction.....	80,229	58,907	47,035
Total.....	\$906,698	\$657,892	\$582,485

The physical depreciation of the plant is about 27 per cent. We apply, therefore, this factor to intangible expense. This is equivalent to \$244,808, in the case of the reproduction cost new.

The accrued retirement reserve for intangible expense based upon 9 years out of 21 years, would on a straight line theory equal \$388,585 and on a five per cent. sinking fund basis, would amount to \$228,448.

WORKING CAPITAL

The late D. R. Roberts in his examination of the company's books found that the average monthly operating expense, which included maintenance, gas and oil, income tax, business profit, and cost of dry wells during the years 1919 to 1922, was \$31,453. In 1922 the monthly operating expenses amounted to \$37,040. We have, however, allowed \$40,000 for cash working capital.

The stock in hand constitutes another item of the working capital. We had the stock checked, but as the stock-list covers over 100 foolscap pages and the material in hand changes daily, we have not considered it necessary to publish the items in detail. A copy of the stock list will be available for the Board of Reference. We have analyzed the items and segregated them as given below.

The total reproduction cost new of the stock amounts to \$348,540.41.

STOCK AS ON JULY 31st, 1923

		Essex	Blenheim	Chatham	Ridgetown	Port Alma
1.	Sleeves and couplings.....	\$740.19	\$517.08	\$2,512.30	\$752.12	\$7,866.85
2.	Valves.....	56.60	21.05	2,235.00	146.85	2,111.93
3.	Collar leak clamps.....	72.82	77.60	778.50	218.34	1,083.10
4.	Stops.....	54.46	58.61	379.70	92.36	191.15
5.	Cast iron fittings.....	208.64	364.70	4,051.77	560.01	2,991.65
6.	Saddles and collars.....	230.90	257.14	1,727.77	614.31	1,547.31
7.	Pipe.....	1,161.21	1,532.32	11,646.16	2,080.05	84,992.73
8.	Regulators.....	830.90	1,219.50	12,211.10	1,101.60	661.50
9.	Miscellaneous.....	834.39	513.97	9,270.09	752.40	8,451.35
10.	Gauges.....			7,421.93	175.00	
11.	Meters.....			68,725.15	60.00	
	Totals.....	\$4,190.11	\$4,561.97	\$120,959.47	\$6,553.04	\$109,903.57

STOCK AS ON JULY 31st, 1923—Continued

	Court-right	Sarnia	Tilbury	Wallace-burg	Dresden	Dover	Dawn and Oil Springs	Total
1.	\$29.22	\$1,214.72	\$186.79	\$2,195.88	\$135.54			\$16,150.69
2.	53.41	284.20	134.28	103.20	73.06	15.00	54.84	5,289.42
3.	4.80	288.61	301.40	3,422.58	28.24			6,275.99
4.	12.12	49.14	320.70	22.64	17.02		14.40	1,212.30
5.	118.31	281.93	361.52	605.71	118.99	5.13	14.57	9,682.93
6.	94.96	174.72	73.27	1,210.10	215.85			6,146.33
7.	300.17	32,908.76	1,393.02	3,908.39	752.51	35,558.27	8,854.42	185,094.01
8.	260.80	1,316.10	573.40		292.10			18,482.00
9.	214.22	970.70	907.82	1,386.68	393.24	57.00	72.80	23,824.66
10.								7,596.93
11.								68,785.15
	\$1,103.01	\$37,488.88	\$4,252.20	\$12,855.18	\$2,026.55	\$35,635.40	\$9,011.03	\$348,540.41

The materials in hand consist of several thousand items ranging in condition from new to almost scrap, and some of them have been in stock for a considerable time.

The bulk of these materials have been purchased since the incorporation of the company, but we have no information as to the quantity bought in each year. We can only assume that the original cost will be in proportion to the average cost index numbers for the past nine years, which is computed to be practically the same as that for July, 1923. Therefore, the original cost in this case will be about the same as the reproduction cost new, or \$348,540.

The physical depreciation of the materials in stock is about 50 per cent., or \$174,270.

The accrued retirement reserve can only be estimated on the assumption that ten years out of the total possible life of twenty years have expired, and we consider this apportionment to be fair under the circumstances. On the straight line basis, the accrued retirement will be about 50 per cent., or \$174,270.00; and on a five per cent. sinking fund basis, it would be $\$348,540.41 \times 10 \times 0.03024$, or \$105,398.62.

VALUE OF SERVICE

"Value of the service rendered the public, having regard to the value and convenience of natural gas as compared with other fuels."

The present day commercial fuels offer a wide variety of choice, and while solid, liquid, and gaseous fuels each have their particular sphere of convenience and efficiency, probably gaseous fuel is in general the most efficient.

Natural gas is a unique fuel; it is a natural resource; it possesses high heat value; it is convenient for use, is easily controlled, and requires the minimum of labour on the part of the consumer.

The accepted standard on this continent for heat content of fuels is the British Thermal Unit, which, for brevity and convenience, will be referred to as B.t.u. This unit means the quantity of heat necessary to raise the temperature of one pound of water one degree Fahrenheit. One B.t.u. is the equivalent heat energy involved in raising one pound 772 feet, or 772 pounds one foot. The nominal heat values of different fuels are:—

Natural gas, Tilbury field.....	1,019.5	B.t.u. per cubic foot
do Haldimand field.....	997.5	do
do Welland field.....	1,009.2	do
Coal gas.....	400 to 600	do
Coal and water gas.....	400 to 600	do
Producer gas.....	150 to 250	do
Steam coal (anthracite).....	14,000	B.t.u. per pound
Bituminous coal.....	12,000	do
Average coal.....	13,000	do
Lignite.....	7,500	do
Peat, air dried.....	6,000	do
Wood.....	5,000	do
Gas coke.....	11,000	do
Electricity.....	3,411	B.t.u. per kw.-hr.
Gasoline.....	19,000	B.t.u. per pound
Kerosene (coal oil).....	18,000	do
Fuel oil (gas oil).....	19,000	do

The fact that natural gas contains about 1,000 heat units per cubic foot, or a town gas has, say, 500, or liquid fuels have about 19,000 B.t.u. per pound,

is not a conclusive index of their relative values. One gaseous fuel may be more efficient than another, or the B.t.u. in one gas may do more work than those in another gas. The best standard for comparison is the B.t.u. per cubic foot of the product of combustion.

All fuels have to receive a certain volume of air for efficient combustion. When the mixture of gas and air is ignited, heat is evolved, but the temperature of such heat before dissipation will not necessarily be proportional to the heat values in the original fuel. Research work is now being conducted by various gas interests on this continent, and it is found that blue-water gas containing only 310 B.t.u. has a more efficient product of combustion and a higher flame temperature than either natural gas, coal gas, or producer gas.

In the final analysis, the fuel which yields the maximum amount of heat service per dollar under proper conditions is the cheapest to use. The consumer is not much concerned about the high or low B.t.u. content of any fuel, but he is interested in its uniformity and reliability, and the cost of service. It will, therefore, be admitted that the value of gaseous fuels depends upon a number of factors, such as the B.t.u. of the products of combustion, flame temperatures, conditions of combustion, temperatures of unavoidable waste heat, uniformity of pressure and supply, design of the appliances used, and proper adjustment of gas and air for efficient combustion. Analogous conditions with regard to other fuels constitute important features of the value of service.

It is admitted that waste takes place in the use of all fuels. We have observed natural gas being used inefficiently. Solid fuels are wasted on all sides. Oil men admit that liquid fuels are often used extravagantly. Electricians recognize that electricity is used efficiently only under certain conditions. Coal gas is wasted by the consumers. The application of proper methods in the utilization of fuels has not yet become general, and the tendency is to disregard efficiency when fuel is cheap. The greatly increased cost of coal has impelled coal-gas engineers to make an intensive study of the use of low-grade gas, and it has been ascertained by scientific research and by experience that high B. .u. value is not the primordial requirement; but an optimum mixture is necessary to secure a complete, rapid, and efficient combustion at the burner head. A fully aerated flame, short and hot, with an effectual contact with the part of the upper cone where combustion is complete, is essential for high efficiencies.

Our desire in this connection has been to present authentic data on the relative value of natural gas and other fuels, but we have not succeeded as well as we anticipated. There seems to be a paucity of information as to actual experience. Some of the following notes have been collected from various sources, and the remainder has been prepared by us and is presented in the hope that it will serve the purpose intended.

The U.S. Department of the Interior (Bureau of Mines) had a number of kitchen tests made by the Department of Home Economics of the Ohio State University in 1917, as a part of the natural gas conservation programme. These tests were made under the careful supervision of capable officials to ascertain the relative cost of natural gas, coal oil, gasoline, and electricity for

cooking. The following table will give in concise form the summary of the results of B.t.u. consumed:—

RESULTS OF KITCHEN TESTS MADE BY THE DEPARTMENT OF HOME
ECONOMICS, OHIO STATE UNIVERSITY

	1,000 B.t.u. natural gas	12,000 B.t.u. soft coal	19,000 B.t.u. coal oil	19,000 B.t.u. gasoline	3,411 B.t.u. electricity
Breakfast for six.....	10,000	132,000	20,900	17,100	3,412
Luncheon for six.....	24,000	138,000	45,600	28,500	10,236
Dinner for six.....	22,000	93,600	43,700	20,900	5,800
Baking four loaves.....	10,000	78,000	7,980	8,360	3,412
Total B.t.u. consumed.....	66,000	441,600	118,180	74,860	22,860
Relative percentage efficiency based upon electric range at 100 per cent.....	34.7	5.18	19.35	30.50	100

While the electric range is not 100 per cent. efficient, we may assume it as such, in order to make comparisons between it and other ranges. If the electric range in ordinary practice has only 50 per cent. efficiency, then the other percentages will be reduced proportionately. An electric water heater will probably give 90 or 95 per cent. efficiency, because the element is immersed in water.

Basing our estimates on the above results we compute the relative cost of one million B.t.u. at Chatham prices, as follows:—

Natural gas, 50 cents per 1,000 cubic feet.....	\$1.44
Soft coal, \$13.00 per ton.....	10.44
Coal oil, 16 cents per gallon.....	6.12
Gasoline, 29 cents per gallon.....	6.88
Electricity, 1½ cents per kw.-hr.....	4.40

The U.S. Bureau of Standards in 1922 conducted a series of carefully supervised tests to determine the efficiency of gas of different qualities, and applied the heat to a vessel containing two quarts of water. The pressure was equal to a three-inch column of water. The following figures are taken at random from the report:—

B.t.u. in gas	Cu. ft. consumed	Total B.t.u.	B.t.u. in gas	Cu. ft. consumed	Total B.t.u.
608	2.33	1,420	453	3.24	1,466
557	2.64	1,470	448	3.26	1,460
549	2.66	1,460	401	3.58	1,440
505	2.91	1,470	352	4.18	1,470
491	2.98	1,465	297	4.96	1,470

Thermal efficiency ranged from 36 to 38 per cent.

It would be reasonable to expect that about 1.50 cubic feet of natural gas with 1,000 B.t.u. per cubic foot would give the same heat results as those mentioned above.

The average heating value of the air and gas mixture was about 180 B.t.u. The conclusions drawn by the U.S. Bureau of Standards were that efficiency

of utilization of manufactured gas is independent of the nominal heat unit per cubic foot in the gas, and that the value of the gas is directly proportional to its heating qualities for practical purposes. They also believe that this relation would hold for natural gas.

The director of the U.S. Bureau of Standards in reply to enquiries made by Mr. Harkness, stated:—

Regarding the relative value of service from natural and manufactured gas, we would say that we regard the value of either kind of fuel gas as proportional to the heating value, provided it is burned in appliances which are well suited to the gas being used.

The majority of our best appliances seem to have been designed for use with manufactured rather than with natural gas, and generally these appliances do not burn natural gas as efficiently as would an appliance which was properly designed for a gas of a higher heating value. There are appliances that are entirely suitable for use with natural gas, however, and in these appliances natural gas is probably of just as much value per heat unit as is manufactured gas.

We have no single set of data which exactly covers this question and such data are rather hard to obtain because efficiency of utilization depends so much upon the appliance used. A given appliance is generally much better suited to one gas than to the other and tests based upon a single appliance are, therefore, unfair to the gas to which it is adapted. A comparison between efficiencies obtained with various types of appliances with good adjustment for various gas supplies does indicate, however, that the value of service from one is as great as from the other. Good gas service in every case requires constant service conditions; especially does it require reasonably constant pressure. In this connection the natural gas companies have not been able to provide as constant a pressure as is customary with the utilities supplying manufactured gas. This has been a great cause for dissatisfaction with and inefficient use of natural gas.

Mr. S. S. Wyer, a well-known engineer, makes the following comparisons between natural gas and other fuels:—

	Total B.t.u.
1,000 cubic feet of natural gas	1,000,000
2,000 cubic feet of manufactured gas	1,000,000
200 pounds calcium carbide (acetylene)	1,260,000
8 imperial gallons of gasoline	1,200,000
7 imperial gallons of kerosene	1,040,000
12 imperial gallons of alcohol	1,091,500
322 kw.-hr. electricity	1,100,000

We have computed the total number of B.t.u. furnished by the various fuels and it is evident that Mr. S. S. Wyer has compared these fuels on a B.t.u. basis, without regard to relative efficiencies of consumption.

The Ohio State University tested some ranges under different pressures, and it was found that the efficiencies obtained from natural gas were from 14 per cent. under 5 inch pressure, to 43 per cent. under 0.2 inch pressure.

Surface combustion methods appears to yield good results. A perfect mixture of gas and air in which the constituents are in a state of intimate neutral collision projected against areas of incandescent solids, produces reaction which is flameless and invisible. Perfect combustion is said to be obtained and the gas is entirely consumed, releasing the total available energy for service. Bone and McCourt applied this method to a steam boiler and claimed to have obtained about 95 per cent. thermal efficiency which is, of course, very high.

The Hydro-Electric Bulletin for September, 1923, quotes an interesting case where electric and gas baking ovens were tested in New York City, with electricity at 3 cents per kw.-hr. and manufactured gas at \$1.15 per thousand cubic feet. The electric oven cost about \$100 per month as compared with

\$45 per month in the case of the gas oven. The reviewer, however, stated that heat generated by a fuel is not the basis of comparison, but the heat actually utilized.

It is noticeable that United States Utility Commissioners are recognizing that the efficiency of gas utilization is not dependent on the calorific value of the fuel when used for ordinary commercial purposes.

Tests made in a Pennsylvania gas furnace under careful control gave 68.2 per cent. efficiency, but in a coal hot air furnace only 48.3 per cent. Mr. E. J. Stephany, of Pittsburg, calculated that one ton of coal having 13,000 B.t.u. per pound, consumed with 55 per cent. efficiency, was equal to 20,000 cubic feet of natural gas containing 1,000 cubic feet consumed at 75 per cent. efficiency.

The Iowa State College made tests with house heating furnaces and found the efficiency with local coal was from 42 to 65 per cent.

The U.S. Bureau of Mines recently made many tests as to the efficiency of house heating boiler furnaces under scientific control. It was found that with coke, 57 to 72 per cent. efficiency was obtained; with anthracite, 58 to 75 per cent.; and with bituminous coal, 49 to 64 per cent.

The heating of the Singer building in New York City with coal firing gave an over-all efficiency of 68 per cent., and with oil firing nearly 80 per cent.

Efficiency tests made of a powdered-coal firing of two Sterling steam boilers with super-heaters at St. Joseph, Mo., by the U.S. Bureau of Mines, gave an average of 78.8 per cent., while other tests at Milwaukee gave 7 to 8 per cent. higher results.

The performance of internal combustion engines is usually based upon 10,000 to 15,000 B.t.u. per H.P.H., and the thermal efficiencies are higher than steam engines. The U.S. Geological Survey made a large number of tests on gas and oil engines. The following are some of the results:—

Engine	Fuel	Brake H.P.	Thermal efficiencies	
			Per I.H.P.	Per B.H.P.
Westinghouse.....	Natural gas	606	28.6	25.5
Snow.....	Natural gas	595	29.4	23.7
Premier.....	Producer gas	368	33.7	25.7
Keorting.....	Producer gas	341	34.0	24.1
Westinghouse.....	Producer gas	500	30.1	25.2
Nurnkey.....	Blast furnace gas	1,186	33.9	28.2
Diesel.....	Oil	297	45.8	32.2

Under average conditions obtaining in households, factories, etc., the thermal efficiencies are not as high as reported above, although theoretically they should be the same.

We believe the following thermal efficiencies will be secured in ordinary practice:—

Natural gas	14 to 35	per cent. in kitchen ranges.
do	50 to 75	" " under boilers and special heating furnaces.
do	70 to 90	" " by surface combustion under boilers.
do	14 to 35	" " in furnaces ordinarily adapted for coal.
do	15 to 30	" " in gas engines.
Coal and water gas . . .	14 to 35	" " in kitchen ranges.
do	15 to 30	" " in gas engines.
do	70 to 90	" " with surface combustion.
Coal	3 to 15	" " in kitchen ranges.
do	35 to 75	" " under boilers, hand fired.
do	50 to 80	" " under steam boilers with mechanical stoker.
do	25 to 60	" " in furnace of heating plant.
Powdered coal	up to 80	" " under steam boilers.
Coke	50 to 75	" " under steam boilers with mechanical stoker.
do	30 to 50	" " under steam boiler, hand fired.
do	20 to 40	" " in furnace of heating plant.
Electricity	50 to 70	" " in kitchen ranges.
do	75 to 85	" " in motors.
do	75 to 95	" " in direct heating.
Fuel oil	15 to 30	" " in kitchen ranges.
do	50 to 80	" " under boilers.
do	15 to 25	" " in oil engines.

Subject to modifications already mentioned, the following table computed by us will indicate the relative cost of one million B.t.u. produced by various fuels used at different efficiencies (see page 241).

Fuel is often purchased with little regard to true economy and serviceableness. Comparison of one fuel with another is often made on the basis of price only, and at other times on both heat units and price. If we regard both coal and natural gas as 100 per cent. efficient, then the relation between coal containing 12,000 B.t.u. per pound at \$12 per ton and natural gas containing 1,000 B.t.u. per cubic foot at 50 cents per 1,000 cubic feet, would be $\frac{12,000 \times 2,000}{1,000}$; that is, 24,000 cubic feet of natural gas at 50 cents per thousand is equivalent to one ton of coal at \$12.

But as has already been suggested their respective efficiencies of consumption should be compared. For example, if the usual efficiency of coal in kitchen ranges is 5 per cent., and of natural gas, 20 per cent., then,

$$\frac{\text{Coal}}{\text{Gas}} = \frac{1,200 \times 1,000,000 \times 20}{50 \times 24,000,000 \times 5} = \frac{4}{1}$$

That is, the cost of coal under this condition would be 4 times that of natural gas.

As another example, take manufactured gas with 500 B.t.u. costing \$1 per thousand cubic feet and natural gas with 1,000 B.t.u. at 50 cents per thousand cubic feet, and, say, 15 per cent. efficiency of both fuels. Then,

$$\frac{\text{Manufactured gas}}{\text{Natural gas}} = \frac{100 \times 1,000,000 \times 15}{50 \times 500,000 \times 15} = \frac{4}{1}$$

That is to say, the cost of manufactured gas under these conditions and at the above price would be 4 times that of natural gas for the same service.

These examples could be multiplied to any extent.

COMPUTED COST OF 1,000,000 B.T.U. AT THE PRICE OF FUELS AT DIFFERENT EFFICIENCIES

Per cent. efficiency	1,000 B.t.u. natural gas at 50 cents per 1,000 cu. ft.	600 B.t.u. coal gas at \$1 per 1,000 cu. ft.	500 B.t.u. coal and C.W. gas at \$1 per 1,000 cu. ft.	12,000 B.t.u. coal at \$13 per ton	11,000 B.t.u. coke at \$12 per ton	Electricity, 3,411 B.t.u. per kw.-hr. at 1½ cts. per kw.-hr.	Fuel oil, 19,000 B.t.u. per lb. at 10 cents per gal.	Gasoline, 19,000 B.t.u. per lb. at 29 cents per gal.
100	\$0.50	\$1.67	\$2.00	\$0.543	\$0.545	\$4.40	\$0.67	\$2.07
95	.527	1.76	2.10	.572	.574	4.62	.706	2.18
90	.556	1.86	2.22	.604	.606	4.89	.745	2.30
85	.588	1.97	2.37	.64	.642	5.18	.79	2.44
80	.625	2.09	2.50	.68	.682	5.50	.84	2.60
75	.667	2.23	2.66	.724	.727	5.88	.895	2.76
70	.714	2.39	2.86	.775	.78	6.30	.96	2.96
60	.834	2.78	3.34	.906	.908	7.30	1.12	3.46
50	1.00	3.34	4.00	1.086	1.09	8.80	1.34	4.14
40	1.25	4.18	5.00	1.36	1.364	.....	1.68	5.20
35	1.428	4.78	5.72	1.55	1.56	.....	1.92	5.92
30	1.668	5.76	6.68	1.82	1.816	.....	2.24	6.92
25	2.00	6.68	8.00	2.172	2.18	17.60	2.68	8.28
20	2.50	8.36	10.00	2.72	2.728	.....	3.36	10.40
15	3.34	11.52	13.36	3.64	3.632	.....	4.48	13.84
10	5.00	.....	.....	5.44	5.456	.....	6.72	.....
5	10.00	.....	.....	10.88	10.912	.....	13.46	.....

The above table may be of service as a convenient means of comparison. For example, for a gas range with an efficiency of, say, 15 per cent.; a coal range, 5 per cent.; an electric range, 50 per cent.; and an oil range, 15 per cent.; the relative cost of fuel would be: with 50-cent natural gas, \$3.34; with \$1 coal gas, \$11.52; with \$13 coal, \$10.88; with 1½-cent electricity, \$8.80; and with 10-cent coal oil, \$4.48. Convenience, cleanliness, and other factors are not considered. To ascertain the cost of a fuel at any efficiency, when such fuel has a different price to that quoted at the head of the columns, simply divide the new price by the column price and multiply the tabulated figures by the quotient. Thus, if natural gas cost 70 cents, then $\frac{70}{50} = 1.4$, and the figures in that column must be multiplied by 1.4.

It may be of service to submit a formula which will enable those interested to compare any one fuel with another. Let the fuels be respectively designated A and B.

Let P represent the cost of A fuel in cents per unit.

" S do do B do do

" Y do B.t.u. in A fuel in same unit.

" Z do do B do do

" E do efficiency of A fuel.

" F do do B do

$$\text{Then, } \frac{A}{B} = \frac{P \times Z \times F}{S \times Y \times E}$$

Example: Let A = Electricity at $1\frac{1}{2}$ cents per kw.-hr.

B = Natural gas at 50 cents per 1,000 cubic feet.

Y = 3,411 B.t.u. per kw.-hr.

Z = 1,000 B.t.u. per cubic foot.

E = Efficiency of 60 per cent. of electricity.

F = Efficiency of 20 per cent. of natural gas.

$$\text{Then, } \frac{A}{B} = \frac{1.5 \times 1,000,000 \times 20}{50 \times 3,411 \times 60} = \text{nearly } \frac{3}{1}$$

The cost of electricity at the above rates is, therefore, 3 times that of natural gas for the same heat service.

In order to make the discussion still more useful, we also submit a nomograph (see page 243) which gives the proportionate cost of fuels operating at any efficiency of consumption, possessing any calorific value, and costing any price per commercial unit.

The chart is developed from the formula previously given, and as its actual derivation is somewhat involved and lengthy, the method of its preparation is omitted. This information, however, can be had on application.

The following example will illustrate the use of the nomograph:—

Suppose coal costing \$13 a ton, with a calorific value of 12,000 B.t.u. per pound, consumed in a kitchen range at 5 per cent. efficiency, is to be compared with natural gas costing 50 cents per thousand cubic feet, with a heat content of 1,000 B.t.u. per cubic foot, and used at 20 per cent. efficiency. Then the following procedure is to be adopted:—

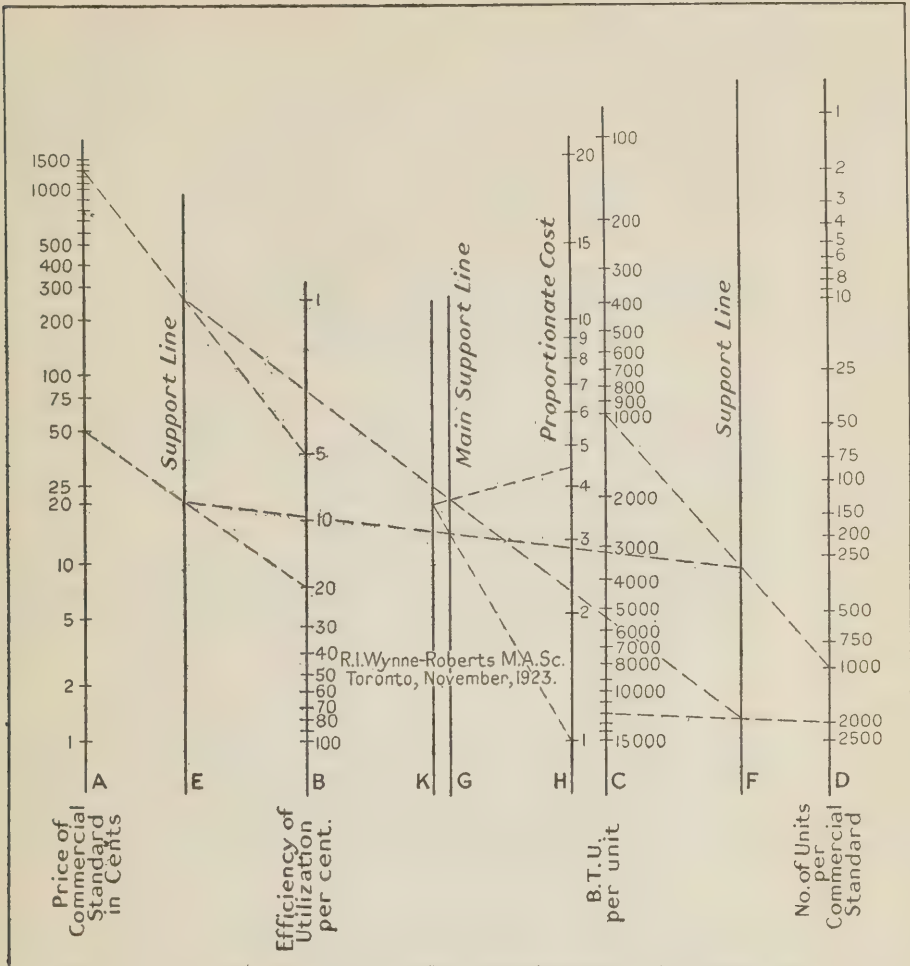
1. Join the point on scale A, representing the cost of a commercial unit of natural gas, to the required efficiency of utilization on scale B, cutting the support line E at a certain point. Similarly obtain a point for coal.

2. Locate the calorific value of the natural gas on scale C, and join it to the point on scale D which represents the number of units contained in a commercial standard (i.e., 1,000 for natural gas, as 1,000 cubic feet are sold for 50 cents), cutting the support line F at a definite point. Find a similar point for coal (2,000 on scale D, as there are 2,000 pounds to a ton).

3. Join the points for natural gas on scales E and F, cutting scale G at a point. In a similar way a point for coal should be located.

4. Join the point for natural gas on scale G to the point of unity on scale H; trace this line back to cut scale K. Through this point and that for coal on scale G, draw another line intersecting the scale of proportionate cost H. This latter point will indicate that coal costs 4.3 times as much as natural gas under the conditions named.

As already explained this chart can be used for the comparison of any two or more fuels.



ALIGNMENT CHART SHOWING THE RELATIVE COST OF VARIOUS FUELS CONSUMED UNDER GIVEN CONDITIONS

Reviewing the foregoing information with respect to the value of service obtained in connection with the use of natural gas as compared with that of other fuels, it is apparent that such value depends upon the hypothesis that natural gas is available in sufficient quantity and at a steady pressure. It is not necessary to maintain a high pressure, as with a low uniform pressure the gas can be utilized more efficiently, provided, of course, that the appliance is well adapted and designed.

The supply of manufactured gas is generally under efficient control throughout the year, but a similar condition with respect to natural gas does not appear to be possible, and this results in unsatisfactory service. The prospects, with depleting gas fields, do not indicate that much improvement can be effected.

Some lines, no doubt, could be enlarged without incurring a heavy expenditure, as much pipe is now in stock and the effect of enlargement would be a steadier supply of gas.

It will be appreciated that each fuel will burn efficiently in appliances specially constructed for it. In this respect, manufactured gas and electricity appear to have an advantage over natural gas, as this latter fuel is commonly burned in a range or furnace originally designed for the consumption of manufactured gas, coal, or wood. Consequently, its practical efficiency is not as high as it would be if it could be consumed in a suitable appliance.

Like manufactured gas and electricity, natural gas offers cleanliness to the consumer, and both in the kitchen range and in the house furnace, the absence of ashes, dirt, and dust should compensate for other disadvantages.

We have discussed in an earlier part of this section the relation between gases on the basis of heat service, that is to say, the quantity of heat units supplied when the gas or other fuel is utilized, and it was noted that natural gas stands high in this respect. When comparative tests have been carried out in kitchen ranges and house furnaces, and when computations are made to ascertain the cost of fuel burnt at varying efficiencies to obtain a definite amount of heat, it has been shown by these experiments and by calculation, that natural gas is the cheapest fuel, inasmuch as it gives the most service for the expenditure incurred.

The economies of distributing natural gas diluted with water gas, so as to prolong the life of the fields, has not been considered by us; but the possibilities in this direction are worth investigation. Mr. Wynne-Roberts reported to the Saskatchewan Government on coal and power investigations in that province and had occasion to make indirect reference to some of the features here involved.

Blue-water gas, producer gas, coke oven gas, and coal gas are now being mixed with natural gas for purposes of conservation.

The analysis of natural gas and coal gas is given below:—

	Haldimand	Welland	Kent
	per cent.	per cent.	per cent.
Oxygen	nil	nil	nil
Carbon dioxide	0.1	nil	nil
Methane	83.5	79.8	87.67
Ethane	7.1	9.0	5.57
Propane	1.9	1.8	1.4
Nitrogen	7.4	9.4	5.0
Hydrogen sulphide	nil	nil	0.5
Inflammable gases	92.5	90.6	94.5
Calorific value in B.t.u.	1,019.5	997.5	1,009.2

The composition of a town gas may be cited as follows:—

	Coal gas	Carburetted water gas	Half coal gas, half C.W. gas
	Per cent.	Per cent.	Per cent.
Hydrogen.....	50	36	43
Saturated hydro carbons.....	34	14	24
Unsaturated “.....	4	9	6.5
Carbon monoxide.....	8	30	19
Carbon dioxide.....	2	5	3.5
Oxygen.....			
Nitrogen.....	2	6	4
Inflammable gases.....	96	89	82.5
Computed calorific value, B.t.u. gross.....	590	500	545
Computed calorific value, B.t.u. net.....	530	450	490

The theoretical quantity of air required for the combustion of different fuels is given below:—

Fuel	Heat value, B.t.u. per cu. ft.	Theoretical cu. ft. air required per cu. ft.
Town gas, water gas.....	304	2.63
carburetted water gas.....	589	6.84
coal gas.....	608	6.00
Producer gas, anthracite.....	125.7	1.053
bituminous.....	125	1.12
coke.....	126.3	0.985
lignite.....	134	1.145
oil.....	151	0.99
peat.....	141	1.17
wood.....	128.7	1.07
Blast furnace gas.....	95.2	0.735
Coke oven gas.....	487	4.76
Natural gas (average).....	853	8.95
high hydrogen.....	834	8.66
low hydrogen.....	870	9.20
Tilbury gas.....	1,019	9.58
Oil gas.....	542	4.94
	per pound	per pound
Kerosene, 0.863 Sp. Gr.....	18,735	189
Crude oil, 0.877 “.....	18,636	187
Gasoline, 0.704 “.....	18,500	193.5
Fuel oil, 0.939 “.....	18,183	178.0

The following table gives the rates per 1,000 cubic feet of manufactured gas in Ontario, as in July, 1923:—

THE PRICE OF MANUFACTURED GAS

Name	Rates per 1,000 cu. ft.	Discounts	Meter rents	Kind of gas	B.t.u.	Remarks
Waterloo Water and Light Commissioners.....	\$2.10 flat	10c	25c per month	carburetted water gas	500 to 525	.....
Belleville Gas Works Dept.....	\$2.00	15c, 15 days 75c, industrial	none	3 coal gas to 1 water gas	485	Minimum charge 30c.
Brockville.....	\$2.00	none	none	carburetted water gas	600	.....
St. Thomas Gas Department....	\$1.70	10c	none	90% coal gas, 10% carburetted water gas	450	Minimum charge 40c.
Kitchener Light Commission....	\$1.60, 1,000 to 10,000 less 5% 10,000 to 25,000 " 10% 25,000 to 40,000 " 15% 40,000 to 100,000 " 20% 100,000 to 200,000 " 25% over 200,000	.....	10c	60% coal gas, 40% carburetted water gas	500	.....
Consumers Gas Co., Toronto....	10c, 100 cu. ft. 9c net 100 cu. ft. } 10,000 9 1/2c gross 100 cu. ft. } 10,000 to 8 1/2c net 100 cu. ft. } 100,000 9c gross 100 cu. ft. } over 8c net 100 cu. ft. } 100,000	1c 1c 1c	.....	50% coal gas, 50% carburetted water gas	500	Service charge 50c
Peterboro H.E.P.C.....	\$2.15	25c	none	carburetted water gas	450	.....
Deseronto.....	Not in business	.....	.....	.....	.....	.....
Napanee.....	Not in business	.....	.....	.....	.....	.....
Oshawa H.E.P.C.....	\$2.15	.....	.....	carburetted water gas	450	Minimum charge \$1.00
Guelph Light and Heat Commission.....	\$1.30 up to 16,500 \$1.30, 16,500 to 65,000 \$1.30 over 65,000	10c 15c 20c	.....	50% coal gas, 50% carburetted water gas	500	Minimum charge 75c per meter per month.

THE PRICE OF MANUFACTURED GAS—Continued

Name	Rates per 1,000 cu. ft.	Discounts	Meter rents	Kind of gas	B.t.u.	Remarks
London Gas Co.....	\$1.15	.....	10c to 63c	50% coal gas, 50% carburetted water gas	509	10% added after 20 days.
Ottawa Gas Co.....	15,000, \$1.60 15,000 to 40,000, \$1.47 40,000 to 80,000, \$1.32 80,000 to 155,000, \$1.17 Over 155,000, \$1.06	10c	18c to \$1.50	87% coal gas 13% carburetted water gas	400	Minimum bill 50c per month.

ACKNOWLEDGMENTS

In conclusion we should state that the work involved in the preparation of this appraisal has been considerably lessened by the readiness with which the officials of the Union Natural Gas Company have placed their services, books, documents, and information at our disposal, and we acknowledge these courtesies with thanks.

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